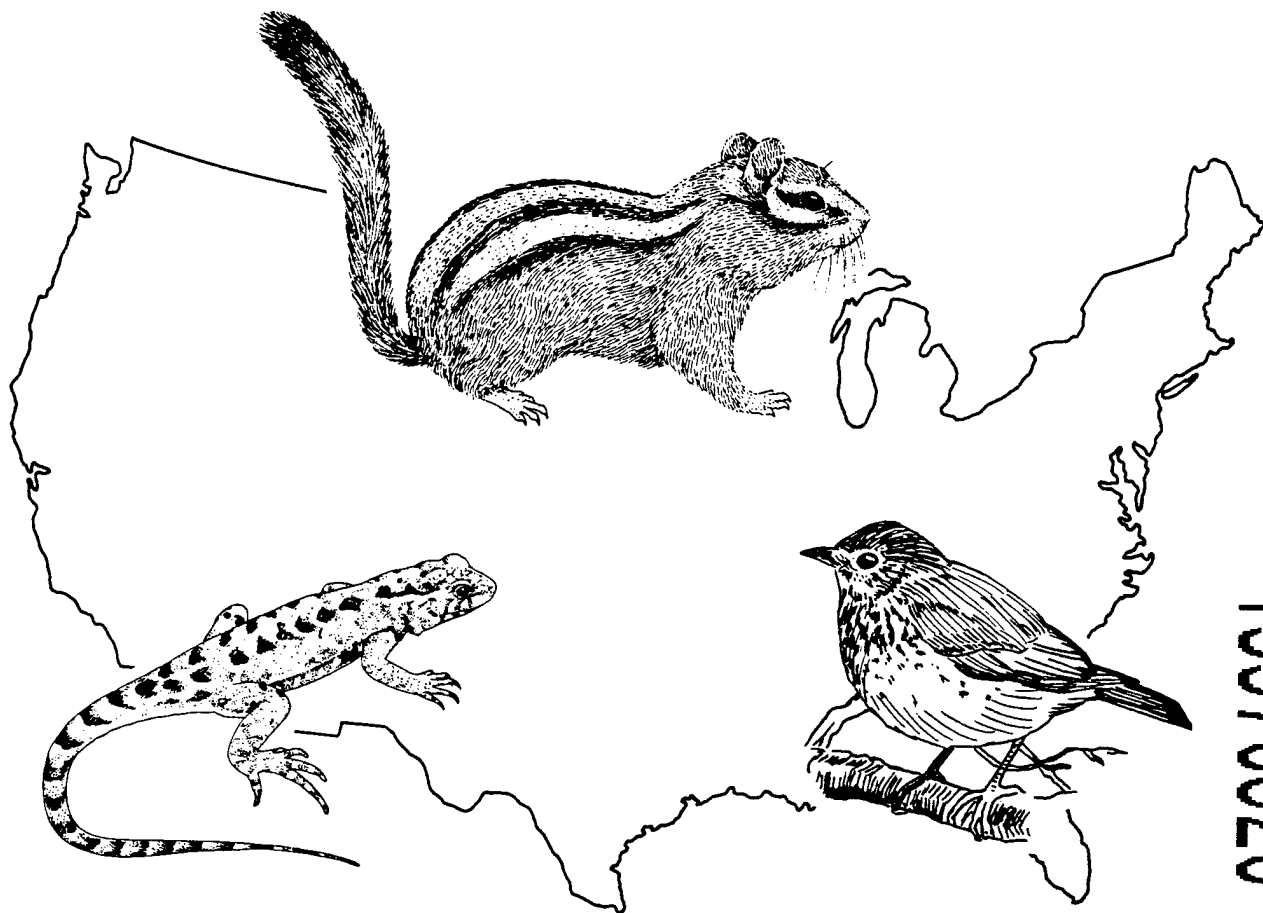


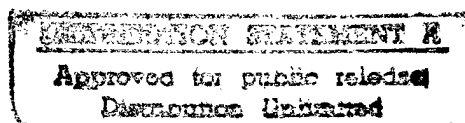
# POTENTIAL FUNDING SOURCES TO IMPLEMENT THE FISH AND WILDLIFE CONSERVATION ACT OF 1980



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Fish and Wildlife Service

**U.S. Department of the Interior**



Credit is given to Jennifer Shoemaker, who designed and produced the cover for this report. The side-blotched lizard and the yellow pine chipmunk drawings used in the cover illustration were prepared by Ellen Blouder and originally appeared in J. Verner and A. S. Bass. 1980. California wildlife and their habitats: Western Sierra Nevada. U.S. For. Serv. Gen. Tech. Rep. PSW-37. 439 pp.

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POTENTIAL FUNDING SOURCES TO IMPLEMENT THE  
FISH AND WILDLIFE CONSERVATION ACT OF 1980

Prepared by  
U.S. Fish and Wildlife Service  
Robert A. Jantzen, Director

For  
Committee on Environment and Public Works  
of the U.S. Senate  
and  
Committee on Merchant Marine and Fisheries  
of the U.S. House of Representatives

As required by  
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Conservation Act of 1980

Fish and Wildlife Service  
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## OVERVIEW

The Fish and Wildlife Conservation Act of 1980, Public Law 96-366 (Forsythe-Chafee Act), authorized the Federal government to provide financial and technical assistance to the States to develop and implement programs for fish and wildlife, especially nongame species. Section 12 of the Act instructed the U.S. Fish and Wildlife Service, in consultation with affected parties, to conduct a comprehensive study to determine the most equitable and effective mechanism for funding a nongame program. Congress specified that this study include, but not be limited to, funding by means of excise taxes on appropriate items. The results of this study were to be presented to Congress, together with recommendations from the Director, U.S. Fish and Wildlife Service, within 30 months after the enactment of the Act. Although Section 11 of the Act authorized the appropriation of \$5 million per year for 4 years for use by the States to develop conservation plans and for use by the U.S. Fish and Wildlife Service to administer the program and conduct the Section 12 study, funds were never appropriated and no action was taken. In December, 1982, an amendment authorizing the U.S. Fish and Wildlife Service to utilize existing monies to cover the cost of the study of funding sources and amending the reporting date to December 31, 1984, was passed by the Congress and signed by the President. This document presents the results of this study.

This is the first study to explore such a broad array of potential sources of funding for fish and wildlife, providing information that can be used to evaluate and compare the sources. It draws from the available studies and data, personal communications, academic writings, and other information pertinent to this subject. The volume of these existing materials, while extensive, was neither complete nor uniform in coverage. Thus, extrapolations and estimates were developed when necessary and possible.

The body of the report presents the concise findings of the study regarding 18 potential fund sources and includes limited tabular material and process-related discussions.

A detailed discussion of the criteria used in the evaluation is included in Appendix A. Appendix B contains detailed analyses of the 18 items. Brief analyses of the seven additional sources which did not undergo intense study are in Appendix C. Appendix D contains a summary of the comments received from the public in response to the announcement in the Federal Register, including suggested additional potential funding sources. Appendix E includes a notice that appeared in Volume 48, No. 210, of the Federal Register (Friday, October 28, 1983) describing the study, defining the 18 potential funding sources, and inviting the comments that were utilized during this study. An addendum, prepared by a contractor, discusses several additional potential sources that were identified near the end of the principal study.



## BACKGROUND

In September, 1937, President Roosevelt signed the Pittman-Robertson Federal Aid in Wildlife Restoration Act (P-R), which initiated a program of Federal grants to the States for the restoration of wildlife (wild birds and wild mammals). It was funded by an excise tax of 10% (later raised to 11%) at the manufacturer/importer level on sporting arms and ammunition, and a 10% excise tax on bows and arrows and handguns added by a later amendment, which was matched on a 3 (Federal):1 (State) ratio to carry out State-proposed projects. The program was effective in restoring and maintaining hunted species and was supported by the States, the hunters who contributed the funding, and the involved industries.

In 1951, a similar act to address the needs of sport fisheries, the Dingell-Johnson Federal Aid in Sport Fish Restoration Act (D-J), became operational. Its funding was derived from a manufacturer/importer excise tax of 10% on fishing rods, reels, creels, and lures until 1984, when it was amended extending the tax to additional items of sport fishing tackle and dedicating duties on yachts and pleasure craft and part of the motor boat fuel tax. Like P-R, the States proposed projects which, on approval, were carried out by the States, with 75% of the costs covered by the Federal government.

These two acts provided very effective coverage of harvested birds, mammals, and fish, which constitute roughly 10% of Americas' vertebrate fauna, thus serving the needs and interests of nearly 70 million Americans. However, only peripheral attention was being directed to the remaining vertebrates of interest and value to an even larger number of Americans. Thus, in the 1970's, Congress began exploring legislation to provide grants to the States for nongame conservation, to complete the Federal-State partnership program for addressing the conservation of America's vertebrate fauna.

The earliest major support for a Federal nongame conservation program was from the International Association of Fish and Wildlife Agencies (then the International Association of Game, Fish, and Conservation Commissioners) in the mid-1960's. By the April, 1979 hearings on HR 3292, more than 260 conservation organizations and agencies had identified their support to Congress, and a concept for a Federal nongame program had been unanimously supported by the fish and wildlife agencies of all 50 States.

In 1972, the International Association of Fish and Wildlife Agencies passed a resolution calling for the establishment of a Federal nongame program and drafted a model State nongame bill. A study sponsored by the Wildlife Management Institute in 1975 resulted in draft legislation relating to nongame

fish and wildlife conservation. In 1976, the Council of Environmental Quality Advisory Committee on Nongame Fish and Wildlife called for a Federal matching grant program.

During many of these early efforts, State needs were identified, including inventory and assessment of nongame wildlife populations and habitats, planning for nongame programs, improved databases, enhanced interstate and State-Federal cooperation, and the implementation of plans.

During the late 1970's, several bills relating to nongame and non-consumptive use of fish and wildlife were introduced in Congress. In 1979, Representative Forsythe introduced nongame legislation (HR 3292) in the House of Representatives; Senator Chafee introduced companion legislation (S 2181) in the Senate in 1980. The Forsythe-Chafee proposal provided that the States must prepare plans for the conservation of nongame fish and wildlife before any management actions were undertaken, and strong incentives were offered for plans structured to cover all fish and wildlife, both harvested and unharvested. This provision was fully consistent with amendments to the P-R and D-J Acts, which authorized the States to engage in comprehensive planning.

Major questions arising during public hearings had to do with the funding mechanism for the program. Potential excise taxes were explored during the consideration of the bill, but were not included in the bill as passed. On September 29, 1980, President Carter signed Public Law 96-366, the Fish and Wildlife Conservation Act of 1980. The Act included the following provision, as amended by Public Law 97-396:

"Sec. 12. study. The Director of the United States Fish and Wildlife Service, in consultation with affected parties, shall conduct a comprehensive study to determine the most equitable and effective mechanism for funding State conservation plans and actions under this chapter, including, but not limited to, funding by means of an excise tax on appropriate items. On or before December 31, 1984, the Director shall report to the Committee on Environment and Public Works of the Senate and to the Committee on Merchant Marine and Fisheries of the House of Representatives the results of such study, together with his recommendations with respect thereto."

The process leading to the establishment of the Fish and Wildlife Conservation Act of 1980, and the present study, reflects input of ideas and information from a broad range of groups and interests. This input will continue through the consideration of appropriate funding sources. Both organized and individual public input have been considered by the U.S. Fish and Wildlife Service Director in making his recommendations to Congress, and additional hearings undoubtedly will offer a substantial opportunity for further input to Congress.

## PURPOSE AND SCOPE

This document is the result of the comprehensive study required by Section 12 of the Fish and Wildlife Conservation Act of 1980. There were three purposes for this study: (1) to develop information about the equity and effectiveness of the identified potential funding sources; (2) to obtain comments and information from potentially affected parties; and (3) to provide results for use by the Director of the U.S. Fish and Wildlife Service in formulating recommendations, as required by the Act.

Comments provided in response to the Federal Register announcement of this study and data received relative to this study were reviewed as part of the consultation process leading to development of the final study report. This report was considered by the Director of the U.S. Fish and Wildlife Service in formulating recommendations for the Senate Committee on Environment and Public Works and the House Committee on Merchant Marine and Fisheries.

Twenty-five potential revenue sources were selected for preliminary consideration (Table 1).

Table 1. Potential revenue sources studied.

- 
- A. Annual appropriations
  - B. 5-10% excise tax on wild-bird seed
  - C. 5-10% excise tax on wild-bird houses
  - D. 5-10% excise tax on wild-bird feeders
  - E. 5-10% excise tax on wild-bird waterers, baths, and heaters
  - F. 5-10% excise tax on wild-animal furs
  - G. 5-10% excise tax on backpacking and camping equipment
  - H. 2-5% excise tax on off-road vehicles:
    - Snowmobiles
    - Off-road motorcycles
    - Other all-terrain vehicles
    - Four-wheel drive vehicles
  - I. 5-10% excise tax on binoculars, monoculars, and spotting scopes
  - J. 5-10% excise tax on wildlife identification books
  - K. Fees of \$0.50-\$2.00 for use of selected Federal lands and waters
  - L. Voluntary contribution by Federal income tax checkoff
  - M. Sale of semipostal stamps with contribution of 25-50% of postage value
  - N. 5-10% excise tax on recreational diving equipment
  - O. 1-5% excise tax on certain photographic equipment and film
  - P. 1-5% tax on certain locatable minerals extracted from Federal lands and waters
  - Q. 1-5% excise tax on travel trailers and campers
  - R. 1-5% excise tax on motorhomes
  - S. \*5% excise tax on dog and cat food
  - T. \*1-5% excise tax or surcharge on Federal timber sales
  - U. \*fee of \$0.50-\$1.00 per cord on Federal firewood sales
  - V. \*5-10% excise tax on wildlife art sales
  - W. \*1-5% excise on downhill ski equipment
  - X. \*1-5% excise tax on cross country skis
  - Y. \*1-5% excise tax on water skis
- 

\*Deleted from detailed analysis after preliminary study (Appendix C).

## METHODS

This section summarizes the methods used to evaluate each potential funding source, the search for data sources, the methods used to estimate potential excise tax revenues or other potential funding, changes in estimated product sales, criteria used in evaluating each potential funding source, and the consultation process.

To identify the potential revenue sources to be considered in this study, the many proposals made to Congress in hearings on this and closely allied legislation were listed. Twenty-five potential funding sources were selected initially. Using immediately available information, these potential sources were screened during the initial phase of study in terms of: (1) the relationship between the potential contributors of the revenue and the beneficiaries of the program; (2) the estimated amount of revenue to be generated each year; and (3) whether or not the potential revenue would be collected disproportionately from certain economic strata in the population. Several of the potential sources were modified or eliminated as a result of this screening, with 18 sources retained for a more detailed evaluation.

A specific definition was adopted for each source to be examined and, where applicable, a rate of taxation was specified by the Funding Recommendations Oversight Group. In all cases, the rates selected for potential excise taxes did not exceed the existing and well-established excise taxes on fishing gear (10%) under the Dingell-Johnson program and on sporting arms and ammunition (11%) under the Pittman-Robertson program.

The extensive search for data on the potential funding sources included several phases. Searches of large computerized data bases were made using identifiers ranging from specific, detailed key words to general overview terms relating to each potential source. Other actions included manual library searches and contacts with associations, other governmental agencies, companies, and individuals.

The analyses of potential funding sources included multivariate regression analyses of historical price-quantity data to estimate the effect that an increase in price, resulting from a potential excise tax, would have on the quantity sold. Data obtained were used in conjunction with regression analyses as the basis for estimating changes in product sales resulting from the potential tax. Individual analyses were developed for potential funding sources that would not involve potential excise taxation of products, such as annual appropriations from the general fund and voluntary contributions by checkoff on the Federal income tax return. Numbers presented in this report reflect rounding adjustments.

Each potential source also was evaluated in terms of the benefits received by those paying the potential tax or fee, as well as the relative contribution by income and age. The latter criterion was designed to determine whether the potential tax payments or other funding would be regressive, progressive, or proportional with respect to individuals.

Consultation was accomplished through announcement of the study in the Federal Register and subsequent comments from affected parties. Direct personal contacts were also made with some of the potentially affected parties in terms of requesting data on production, costs, and consumer surveys of product utilization.

## CRITERIA FOR EVALUATING POTENTIAL FUNDING SOURCES

### FUNDING POTENTIAL

Funding potential was estimated both for sources involving the potential levy of an excise tax on products, such as snowmobiles, and sources not involving excise taxes, such as the sale of semipostal stamps. Revenue from potential excise taxes on products generally depends on three factors: the tax rate; the quantity and value of products; and the sensitivity of demand to price change. A given potential tax rate can yield a variable amount of revenue, depending on how sensitive the quantity demanded is to price. If the quantity purchased does not change significantly as the price varies, the tax revenues can be approximated by multiplying the tax rate by the current dollar volume of sales. If the quantity purchased is sensitive to price, price increases resulting from a potential tax generally decrease the number of units purchased and the potential revenue from the tax is reduced. However, the most significant factor affecting tax revenue is the level of sales. The sales volume for each type of product was estimated under each potential tax rate. Therefore, the potential excise tax revenue estimates generally reflect changes in the level of sales resulting from higher prices related to a potential tax. In cases where price sensitivity was not known or could not be estimated, a range of sales and tax revenue estimates is usually shown.

### ECONOMIC EFFICIENCY

The efficiency of the economic system in allocating, by consumer choice and purchase, the flow of resources to their highest valued uses can be increased or impaired by a tax (Musgrave and Musgrave 1980). If the current level of production of a particular good is considered socially optimal or is below optimum due to a monopolistic industry structure, then a distorting tax, such as an excise tax, causes some consumers to purchase less of the good, switch to another untaxed good, or forego purchase and increase savings. The introduction of the tax distorts consumer choice by moving the consumer from a preferred to a less preferred outcome (as compared to raising the same amount of revenue in a nondistorting manner). This loss in economic well-being is known as an "excess burden" because it represents a loss of well-being beyond the loss associated with the payment of the tax itself to the government (the latter is known as direct burden).

Extensive literature on "optimal taxation" has focused on minimizing the excess burden while raising a given amount of revenue (Baumol and Bradford 1970). The conclusion is that goods should be selected for potential taxation

that are not very sensitive to price; i.e., the quantity purchased by the consumer will not change much as a result of the price increase associated with the excise tax. This concept is known as price inelasticity. The percentage of excess burden can be thought of as the cents lost per dollar of tax revenue received. Economic efficiency is achieved by minimizing the economic losses per dollar of tax revenue. The more price-inelastic the good is, the higher the optimal tax rate (Baumol and Bradford 1970). Information on price elasticity is also needed to measure how the quantity of sales changes with the rate of taxation.

Positive efficiency effects of a tax can also occur if the tax reduces the output level of a particular good to a more socially optimal level. For example, the current level of output of a product may exceed the economically justified production because the costs of environmental degradation resulting from production are not paid by the producers and consumers, but by society at large. This is known as a negative externality (Herfindahl and Kneese 1974).

When the current level of output is excessive, taxation to raise revenue tends to reduce the output level closer to the social optimum because taxes act as a way to "internalize" these spillover costs to producer decisionmaking (Mishan 1971). The improvement in allocative efficiency due to the effect of the taxes in redirecting resources from a lower valued use to a higher valued use is known as "excess benefit" (Terkla 1984).

#### BENEFITS RECEIVED

The principle that taxes paid by an individual should correspond to the benefits the individual receives from government services dates back to Adam Smith's The Wealth of Nations (Cannon, ed. 1904). The benefits received principle relates to the currently held concept of fairness of a tax or a just tax. The basic concept is that those who benefit most from a government-provided service should pay more for the service than those who use it very little.

In the present study, this criterion was evaluated by considering whether or not payers of the tax would benefit from improvements in the management of wildlife habitats and populations. Birdwatchers, nature photographers, campers, and hikers, for example, benefit directly from improvement in wildlife resources. The protection of wildlife habitat also maintains open space in urban-suburban areas and environmental quality in rural areas. Thus, many individuals may be indirect beneficiaries of government expenditures to manage wildlife habitat. Krutilla (1967) and Brookshire et al. (1983) pointed out that many people derive satisfaction from just knowing that wildlife exists and that these persons often are willing to pay based on the knowledge that wildlife will continue to exist in a given area. These "existence" benefits are very diffuse across the population as a whole. In addition, potential tax revenues would enable States to carry out their "public trust" responsibilities under the Public Trust Doctrine. This is a general benefit associated with many of the potential revenue sources.



When the benefits received criterion is applied, the emphasis is placed on the linkage between the potential tax paid and the activities for which the funds are used. Because any tax may generate existence values, specific benefits are evaluated on the basis of the percentage of purchasers using the goods for wildlife-related activities. For many tax revenue sources, the purchases of goods, primarily or secondarily used for nonconsumptive wildlife purposes, can be compared with total industry sales. If these wildlife-related expenditures are a significant portion of the total sales, a tax on that good may correspond to a tax "in lieu of charges" application of the benefits received criterion (Musgrave and Musgrave 1980). This approach recognizes the difficulty of paying a fee per recreational experience and roughly relates the level of benefits with expenditure on the goods necessary for that activity instead. This is the logic behind the highway users and Federal gasoline taxes. The other side of the benefits received linkage relates to whether or not people who do not buy a taxed good still receive the benefits of wildlife management financed by others. Even if all the people who buy the good use it for wildlife recreation, the benefits received linkage is not complete if a person can still participate in wildlife recreation (and, hence, receive benefits from improved wildlife management) without the good.

#### ABILITY TO PAY

When direct beneficiaries of government expenditures cannot be identified (as in the case of National defense or the space program), or society chooses not to tax on the basis of benefits received, the ability to pay criterion is often used to evaluate the fairness or equity of a tax. This criterion involves assessing the relative sacrifices in material well-being made by individuals subject to a given tax. A tax generally is considered equitable if equal contributions are made by taxpayers at all income levels. Assuming that the level of income is an acceptable measure of material well-being, the equity of a potential tax can be measured by the percentage of income paid as taxes. The tax is considered progressive if the percentage of income paid as taxes rises as income increases. If the percentage of income paid as taxes decreases as income rises, the tax is regressive because lower income earners pay relatively more of their income for the tax. The tax is considered proportional to income if the taxes paid remain a constant percentage of income regardless of the level of income. In this study, the term income is defined consistent with the Bureau of Census' definition of "money income". This is an annual measure of current before-tax income which includes salaries, wages, interest income, rental income, and cash transfer payments (U.S. Bureau of Census 1984). However, a difficulty arises using current income to evaluate ability to pay for long lived durable goods. For many durable goods, expected lifetime income may be a better indicator. However, such measures of income are not available.

The Suits Index (Suits 1977) is used to measure the degree of progressiveness or regressiveness associated with an excise tax. The closer the Suits Index is to zero, the closer the tax is to a proportional tax. A negative Suits Index indicates a regressive tax. The larger the negative number, the more regressive the tax is. A positive Suits Index indicates that the tax is progressive.

In describing the distribution of the tax burden, the terms "low" or "high" income taxpayers may be used. They are generally used to refer to households or taxpaying units with an income below \$10,000 (in 1980) or above \$50,000 (in 1980), respectively.

#### CONSULTATION PROCESS

The U.S. Fish and Wildlife Service was directed by Congress to consult with potentially affected parties in the performance of this study. Constraints on time and funds precluded direct contact during this study with all of the manufacturers, retailers, consumers, and other parties concerned with the potential funding sources. Thus, consultation entailed several measures, each aimed at providing accurate information to parties having an apparent interest in one or more of the sources under study and obtaining a statement of their views. On October 28, 1983, a notice was published in the Federal Register (Volume 48, No. 210) describing the study and the potential funding sources to be examined and inviting public comments. Copies of this notice were sent directly to approximately 500 manufacturers, importers, retailers, conservation organizations, and other potentially affected groups. Similar information also was incorporated into news releases which were distributed Nationally to the media. The public was provided a name and telephone number to which they could direct questions. Finally, the chairman of the oversight group accepted all invitations to meet with groups to explain the study and its purpose.

Other contacts included personnel in government agencies responsible for collecting data on product sales and/or administering programs that would be affected by implementation of taxes on the various funding sources and manufacturers and manufacturing associations with data on product sales. Contacts also were made with several foreign countries through the Department of State on the sale and administrative costs of semipostal stamps.

The published announcement in the Federal Register and news media resulted in several hundred replies offering comments on the nongame program, the proposed study, and the potential funding sources. The data resulting from the consultation process and other sources are referenced throughout the study. The views of the respondents are summarized in Appendix D.

## ANALYSIS OF POTENTIAL FUNDING SOURCES

Table 2 presents an overview of the analysis of potential funding sources. The potential funding estimates shown in this table do not reflect the costs of administering a funding program under the 1980 Fish and Wildlife Conservation Act. The potential administrative costs would be subtracted from the estimated funding potential. Thus, the funds potentially transferred to States for wildlife management programs, especially nongame, would be lower than the funding potential estimates in Table 2.

The percents in the "Loss in Economic Efficiency" column show the estimated loss of economic well-being per dollar of potential tax, as described above. The higher percentages indicate more loss per dollar of potential revenue. For example, a 5% loss in economic efficiency means that each dollar of potential tax revenue would result in a \$0.05 loss in economic well-being because fewer articles would be sold due to the higher price with the tax. A 10% loss means a \$0.10 loss in economic well-being per dollar of potential revenue.

The entries under the "Ability to Pay" column indicate whether or not the potential tax payment as a percentage of income increases as income increases (progressive) or whether the percentage of income paid as taxes falls when income increases (regressive). A proportional entry indicates that the percent of income used for the purchase of the respective article would not vary significantly by level of income. In addition, a Suits Index or range of this Index is shown when possible.

The information used to estimate potential revenue from visitor use fees in item K was not disaggregated for a \$0.50 and \$2.00 charge, due to data limitations. However, the single point estimates reported in Table 2 generally fall within the range between \$0.50 and \$2.00. An alternative analysis that does provide estimates for both \$0.50 and \$2.00 visitor use charges is reported in Appendix B.

The information and data developed for each potential funding source are summarized below. For sources involving potential excise taxes on products, "net sales" data are shown when possible. These "net sales" show the probable reduction in dollar volume of output resulting from each potential tax rate. Adding "net sales" and the "potential tax revenue" yields estimated gross sales. When the potential tax rate is "0", no potential tax is assumed and net sales are equivalent to estimated gross sales. Gross sales data, and, when possible, quantity of sales are shown in the detailed analyses in Appendix B.

Table 2. Overview of evaluation of potential funding sources.

Potential sources	Funding potential (mill. of 1980 \$)		Loss in economic efficiency	Benefits received	Ability to pay
	1980	2000			
A. Annual general fund appropriations	variable and uncertain		7-22%	See page 15	Progressive (+0.32/+0.19)
B. 5-10% excise tax on wild-bird seed	3.8-7.3	4.5-8.6	2.6-5.5%	See page 16	Regressive (-0.37)
C. 5-10% excise tax on wild-bird houses	0.5-0.9	0.5-1.1	2.6-12.0%	See page 19	Regressive (-0.25)
D. 5-10% excise tax on wild-bird feeders	1.3-2.5	1.5-3.0	2.6-12%	See page 19	Regressive (-0.23)
E. 5-10% excise tax on wild-bird waterers, baths, and heaters	0.6-1.2	0.7-1.4	2.6-12.0%	See page 19	Regressive (-0.32)
F. 5-10% excise tax on wild-animal furs	11.2-21.4	57.0-108.5	See page 20	See page 20	See page 20
G. 5-10% excise tax on backpacking and camping equipment	14.3-28.1	25.2-42.7	3-15%	See page 21	Regressive (-0.15)
H. 2-5% excise tax on off-road vehicles: (Total):	76.8-147.3	2,334.0-5,460.0	See page 22	See page 22	See page 23
Snowmobiles	3.5-8.0	Negligible	2.6-7%		
Off-road motorcycles	5.9-14.6	53.6-128.8	1.3-3.2%		
Other all-terrain vehicles	0.8-1.5	0.8-1.8	See page 22		
Four-wheel drive vehicles	66.6-123.2	2,280.0-5,329.0	8.3-27%		
I. 5-10% excise tax on binoculars, monoculars, and spotting scopes	2.3-4.6	5.4-10.8	0.7-2%	See page 24	Regressive (-0.28)
J. 5-10% excise tax on wildlife identification books	0.5-1.0	2.0-4.0	See page 25	See page 25	Regressive

Table 2. (concluded).

Potential sources	Funding potential (mill. of 1980 \$)		Loss in economic efficiency	Benefits received	Ability to pay
	1980	2000			
K. Fees of \$0.50-\$2.00 for use of selected Federal lands and waters (Total):	103.1	123.6	See page 26	See page 25	Regressive
Fish and Wildlife Service	12.2	14.6			
National Park Service	15.0	18.0			
Forest Service	50.1	60.0			
Army Corps of Engineers	7.5	9.0			
Bureau of Reclamation	18.3	22.0			
L. Voluntary contribution by Federal income tax checkoff	40.0	54.5	See page 26	See page 27	Regressive
M. Sale of semipostal stamps with contribution of 25-50% of postage value	11.3-203.4	13.4-240.3	See page 27	See pages 27-28	See page 27
N. 5-10% excise tax on recreational diving equipment	1.7-3.1	Negligible	See page 28	See page 28	Regressive
O. 1-5% excise tax on certain photographic equipment and film	25.2-124.0	102.8-512.3	0.86-1.68%	See page 30	Proportional (-0.09)
P. 1-5% tax on certain locatable minerals extracted from the public domain	0-120.0	0-141.2	See pages 30-31	See page 31	See page 31
\$10-\$25 claim renewal fee	12.1-30.2	12.1-30.2			
Q. 1-5% excise tax on travel trailers and campers	5.3-23.0	19.1-90.5	1.5-9%	See page 34	Proportional (-0.09)
R. 1-5% excise tax on motorhomes	4.5-19.5	8.6-37.6	2-12%	See page 35	See page 35

## A. ANNUAL GENERAL FUND APPROPRIATION

Annual general fund appropriations for State nongame programs are available to the level Congress determines is socially desirable. Because of the discretionary nature of this program relative to defense, social welfare, and other programs, funding for nongame wildlife from this source would vary from year to year based on other Federal priorities and general tax revenues, which depend on the overall level of economic activity.

The economic rationale for a general appropriation is that the benefits of a particular government program, such as nongame wildlife management, would be so widespread among the entire population that identification of specific beneficiaries would be difficult. For example, the 1980 National Survey of Fishing, Hunting and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) noted that 93.2 million Americans (55% of the population) over the age of 16 engaged in some form of nonconsumptive wildlife-associated activity. In addition, the continued existence of many species of nongame wildlife is of value to many people, even if they do not actually visit a site for viewing or photography. In this sense, wildlife can be thought of as a "public good". One advantage of a general fund appropriation, compared to voluntary methods, is that it reduces the ability to avoid payment and still enjoy the benefits of a fish and wildlife conservation program. Although a large portion of the benefits of nongame wildlife management would be very widespread, additional benefits would accrue to persons who make special trips to wildlife refuges or National forests. Therefore, financing of nongame wildlife solely from general appropriations would be inconsistent with the benefits received principle of taxation.

Depending on how additional tax revenue is obtained, the percentage of excess burden could be as low as 7% or as high as 22%. That is, if marginal tax rates are raised, \$0.07 to \$0.22 of production is lost to the economy for each dollar of additional tax revenue (this topic is further discussed in Appendix A). If average tax rates are raised without raising marginal tax rates, the burden is substantially reduced because economic behavior is more sensitive to marginal rates than to average rates. If revenue for nongame wildlife management comes from redirection of existing tax revenue, no new excess burden is created.

Individual income and corporate taxes, which are used for general fund appropriations, are relatively progressive. That is, upper income people generally pay a larger percentage of their income as taxes than do middle or lower income households.

## B. POTENTIAL EXCISE TAX ON WILD-BIRD SEED

Funding from this source would be obtained by a potential excise tax of 5 to 10% on wild-bird seed, levied at the manufacturer/importer level. Seed for use by domestic or farm animals would be excluded.

Potential sales of wild-bird seed in 1980 were estimated based on the 617 million pounds of wild-bird seed reported as purchased by respondents to the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (Shaw 1983). The value of wild-bird seed in 1980 was estimated at \$0.13 per pound at the manufacturers' level. Total sales of wild-bird seed in 1980 were estimated at \$80.2 million (617 million pounds multiplied by the estimated \$0.13 per pound producer value). Sales in the year 2000 were projected based on the increase in U.S. resident population from 227.2 million in 1980 to 267.4 million in 2000. The population estimate for the year 2000 was based on the "most likely projection" from the U.S. Bureau of the Census (U.S. Department of Commerce 1982). The sales estimate for 2000 did not reflect any increase for growth in real income from 1980 to 2000 because a demand equation could not be estimated due to lack of historical data.

Factors influencing the size of price elasticity and testimony by a manufacturer before a Congressional Committee during hearings leading to passage of the 1980 Fish and Wildlife Conservation Act were relied on to evaluate the reduction in sales due to 5 and 10% taxes because data were not available to statistically estimate price sensitivity (U.S. Congress 1980). This manufacturer stated that the percentage change in quantity would be equal to the percentage change in price resulting from a potential tax (U.S. Congress 1980). Based on economic theory (Hirshleifer 1976), this seems to be an upper limit to price sensitivity and the demand could be less price sensitive, resulting in less than an equal percentage reduction in quantity (unless identical "nonwild" bird seed were developed). This upper limit relationship between quantity and price change was assumed in estimating sales reductions from the potential taxes.

Estimates of potential tax revenue were developed (Table 3). These estimates included potential revenue obtained from sales of imported wild-bird seed, such as thistle seed. The duty collected from imports of wild-bird seed, under tariffs existing in 1980, was estimated to fall within the range of \$93,000 to \$186,000. Assuming that the duty collected was the median (\$139,500), the added duty estimated for State wildlife programs, under potential 5 to 10% tax rates, would be about \$60,000 to \$120,000. This added duty is included in the potential tax revenue (Table 3).

A potential tax on wild-bird seed would cause minimal distortion to the economy. About \$0.02 of economic efficiency loss per dollar of revenue would be expected. The tax would be quite regressive because expenditures do not rise significantly with income. In addition, a higher percentage of the tax would be paid by the elderly because expenditures for wild-bird seed increase as the age of the purchaser rises. Thus, disproportionate tax payments would be made by lower income and elderly individuals, compared to the population as a whole.

In terms of benefits received, the linkage is reasonably good. About half of the current nongame checkoff funds are being spent on wildlife management related to birds (although the majority of the species are raptors). If interest in feeding birds implies a general interest in wildlife, the benefits received by payers of the tax would be fairly high.

Table 3. Estimated potential annual sales of, and tax revenue from, wild-bird seed (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	80.2	0	94.4	0
5%	76.4	3.8	89.9	4.5
10%	72.9	7.3	85.8	8.6

#### C, D, and E. POTENTIAL EXCISE TAX ON WILD-BIRD PRODUCTS

Potential funding from wild-bird products would be obtained by an excise tax of 5 to 10% on wild-bird houses, feeders, waterers, baths, and heaters, levied at the manufacturer/importer level.

Sales of wild-bird houses, feeders, and baths in 1980 were estimated based on retail purchases reported in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). These retail purchases were converted to producer values using price markups estimated for the wild-bird products industry by George et al. (1982). Potential sales in the year 2000 were projected based on an increase in U.S. resident population from 227.2 million in 1980 to 267.4 million in 2000. The estimate for 2000 is based on "the most likely projection" from the U.S. Bureau of the Census (U.S. Department of Commerce 1982). The sales estimate for 2000 does not reflect any increase for growth in real income from 1980 to 2000 because a demand equation was not available and could not be estimated due to lack of historical data. The potential revenues estimated from this funding source are listed in Table 4.

Individuals with knowledge of this industry (Frank pers. comm.; George pers. comm.; Hyde pers. comm.) indicated that imports comprise an insignificant share of the United States market for these products. Therefore, significant import duty is not collected under existing tariff schedules, and no significant revenue would be collected from imports if 5 to 10% tax rates were levied to provide funding for State wildlife programs. Data were not available for wild-bird waterers or heaters. Therefore, the amount of additional revenues that might be obtained from potential taxes on these products is unknown.



Table 4. Estimated potential annual sales of, and tax revenue from, wild-bird products (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
<u>Wild-bird houses</u>				
0	10.3	0	12.1	0
5%	9.3 to 9.8	0.5	11.0 to 11.6	0.5
10%	8.5 to 9.4	0.8 to 0.9	9.9 to 11.0	1.0 to 1.1
<u>Wild-bird feeders</u>				
0	27.9	0	32.8	0
5%	25.2 to 26.6	1.3	29.7 to 31.3	1.5
10%	22.8 to 25.4	2.3 to 2.5	26.8 to 29.8	2.7 to 3.0
<u>Wild-bird baths</u>				
0	13.2	0	15.5	0
5%	11.9 to 12.6	0.6	14.0 to 14.8	0.7
10%	10.8 to 12.0	1.1 to 1.2	12.7 to 14.1	1.3 to 1.4

Minimal economic distortion is likely from a 5% potential tax on these products, and the excess burden should not exceed 6%, but a 10% tax could cause as much as a 12% excess burden. Due to the low price of these products, a 10% tax would result in about \$0.50 to \$1.00 tax paid per household per year. Expenditures on wild-bird feeders rise with age, implying that a disproportionate share of the tax would be paid by the elderly. There is no discernible age pattern for people who purchase wild-bird houses and baths.

Although a potential tax on these products represents less than one-hundredth of 1% of income, a fairly strong regressive pattern would result. Thus, lower income and elderly individuals would pay a disproportionate share of a potential tax on these items.

Much like wild-bird seed, the benefits received linkage may be fairly strong. Currently, about half of nongame revenues available to the States are being spent on management programs for birds (although raptor management receives the bulk of the funds). If interest in birds that use these products implies a general interest in wildlife, then the benefits received linkage would be good.

#### F. POTENTIAL EXCISE TAX ON WILD-ANIMAL FURS

This potential funding source involves an excise tax on wild-animal furs or pelts from animals that are trapped in the wild. Furs from animals raised on fur farms or fur ranches would be excluded.

The estimated level of wild fur sales are listed in Table 5. The year 2000 revenues were estimated using a revenue forecasting equation (see Appendix B) and economic theory.

Table 5. Estimated potential annual sales of, and tax revenue from, wild-animal furs (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	294.5	0	1,492.0	0
5%	224.4 to 252.4	11.2 to 12.6	1,136.0 to 1,278.8	57.0 to 64.0
10%	160.0 to 214.2	16.0 to 21.4	814.0 to 1,085.1	81.0 to 108.5

Substantial sales and tax revenue increases by the year 2000 reflect Bureau of Economic Analysis projections of a near doubling of per capita real income by the year 2000 and the apparent sensitivity of purchases to income.

Currently, furskins are imported duty free. However, the levy of a potential 5 to 10% excise tax on imports of wild furs would have yielded estimated revenue of about \$4.2 to \$9.4 million in 1980, increasing to an

estimated \$22 to \$57 million in the year 2000. These potential revenues would be added to the revenues shown above (Table 5), which reflect potential revenues derived only from transactions at the point furs are purchased from trappers.

The bearer of the burden of the potential tax, the price sensitivity of demand for wild furs, and the excess burden of the tax depend on whether the bulk of the revenue comes from species with a substantial ranch supply (such as mink) or from predominantly wild species. For species such as mink, with a 90% ranch supply, trappers would bear almost the entire tax. The excess burden borne by trappers could be substantial. For the majority of wildlife species, consumers (and possibly trappers) would bear the tax and the excess burden. Given the probable large price elasticity of demand for wild furs, a 10% tax could reduce sales by as much as 30%.

Although information was not available on purchases of solely wild furs, data on consumer purchases of fur clothing indicate that a tax on wild furs would be close to proportional or slightly regressive for species with no significant ranch supply. For ranch species, the tax burden of the trapper would be regressive. Purchases of fur clothing peak in the 35-44 age class and drop off rapidly as age increases beyond 45.

The benefits received relationship may be weak for wild furs unless wildlife habitat management targeted at nongame species substantially increases habitat quantity and quality for commercially valuable furbearing animals.

#### G. POTENTIAL EXCISE TAX ON BACKPACKING AND CAMPING EQUIPMENT

Funding from this source would be obtained by a potential 5 to 10% excise tax on backpacking and camping equipment. Backpacks include internal and external frame packs and soft packs. Camping equipment includes tents, lanterns, camp stoves, sleeping bags, and tent heaters.

Data on sales of backpacks and camping equipment were obtained from the National Sporting Goods Association and other sources. Equations derived from these data and estimates of price elasticity, obtained elsewhere, were used to estimate sales and tax revenues (Table 6). Some growth may occur in future revenue potential due to projected increases in sales of backpacks.

These potential revenue estimates include import duty estimated at \$1.1 to \$2.1 million under the 5 to 10% tax rates, assuming the reduction in import sales is proportional to the reduction in domestic production. These potential taxes would be added to the estimated duty of about \$3.3 million collected in 1980 under existing rates of duty.

The economic efficiency effects of a 5% tax would be about average among the potential tax sources. A 5% tax would result in about \$0.06 of economic efficiency loss for every dollar of tax revenue gained. A 10% tax could result in a \$0.15 loss of economic efficiency for every dollar of tax revenue.

Table 6. Estimated potential annual sales of, and tax revenue from, camping and backpacking equipment (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	293.4	0	545.2	0
5%	286.8	14.3	503.6	25.2
10%	280.9	28.1	426.8	42.7

In terms of ability to pay, a tax on backpacking and camping equipment would be somewhat regressive. In the low income group, above average expenditures are concentrated in the 18 to 34 age brackets.

The benefits received linkage of a tax on backpacking and camping equipment would be partly influenced by the extent of expenditures by States for camping and hiking areas as part of their wildlife conservation plans. The presence of wildlife was important to about half the persons who went backpacking and camping according to studies by Kellert (1978). About 20% of the people who bought camping or backpacking equipment did so with nonconsumptive use of wildlife as one of the primary uses of such equipment (Shaw and Mangun 1984).

#### H. POTENTIAL EXCISE TAX ON OFF-ROAD VEHICLES

This potential funding source includes a potential 2 to 5% tax on snowmobiles, off-road motorcycles (units not designed for use on streets or highways), other all-terrain vehicles, and four-wheel drive vehicles (gross vehicle weight  $\leq 10,000$  lbs). This includes pickup trucks, sport utility vehicles, and station wagons with four-wheel drive.

The available data, including data from snowmobile and motorcycle associations, were used to estimate statistical equations when possible. The equations and other data were used to estimate tax revenue and the effects of different tax rates on industry sales. Table 7 includes estimates for snowmobiles, off-road motorcycles, other all-terrain vehicles, and four-wheel drive vehicles.

Table 7. Estimated potential annual sales of, and tax revenue from, off-road vehicles (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	4,217.0	0	122,190.0	0
2%	3,826.0	76.8	116,753.0	2,334.0
5%	2,946.0	147.3	109,203.0	5,460.0

The percentage of the total potential tax revenue from each of the four sources is 5% from snowmobiles, 7% from off-road motorcycles, 1% from other all-terrain vehicles, and 87% from four-wheel drive vehicles. Data on each of these sources are presented in Appendix B. The large increases in tax revenue by the year 2000 are a result of large projected increases in four-wheel drive sales. These projections are based on just a few years of data and reflect Bureau of Economic Analysis forecasts of a doubling of real per capita disposable income. Therefore, the estimates of sales and revenue in the year 2000 are subject to large uncertainties.

In 1980, duty estimated at about \$168.4 million was collected under existing rates of duty on off-road vehicles, excluding certain all-terrain vehicles for which data were not available. Potential taxes of 2 to 5% would yield additional duty of about \$20.5 to \$41.0 million, assuming reductions in import sales would be proportional to domestic production loss. This potential duty of \$20.5 to \$41.0 million was included in the potential revenue estimated above.

Due to the large price elasticity of demand for four-wheel drive vehicles, the economic efficiency effects of a 5% tax on these vehicles would be significant. The percentage excess burden of a 5% tax on four-wheel drives could be as high as 27% (\$0.27 per dollar) of tax revenue. The economic efficiency effects on off-road motorcycles are quite small, however, ranging from \$0.013 per dollar of tax revenue at a 2% tax to \$0.032 per dollar of tax revenue at the 5% tax rate. The available data were not sufficient to estimate demand equations for all-terrain vehicles and snowmobiles.

In terms of benefits received, surveys have indicated that a majority of four-wheel drive vehicle owners use their vehicles for recreational purposes (Newsweek 1982a; Four Wheeler Magazine, May 1984). The direct and indirect association of recreational activities using four-wheel drive and other off-road vehicles with wildlife, and the benefits resulting from the tax-financed

acquisition of habitat or public access are not quantified at this time. An "excess benefit" of a tax on off-road vehicles is the reduction in the number of vehicles sold and, therefore, a reduction in wildlife harrassment, soil loss, water quality degradation, and habitat destruction resulting from the increasing use of these vehicles.

A tax on new four-wheel drive vehicles likely would be proportional and possibly progressive in nature. Lower income groups buy few off-road motor-cycles or trucks, in general, compared to their proportion in the population.

#### I. POTENTIAL EXCISE TAX ON BINOCULARS AND SPOTTING SCOPES

Funding from this source would be from a potential excise tax of 5 to 10% on binoculars, monoculars, and spotting scopes, levied at the manufacturer/importer level.

Potential sales of binoculars in 1980 and 2000 were estimated with a demand equation derived from the historical trend in purchases of imported binoculars. Currently, about 85% of total binocular sales are imported, with domestic production accounting for the remaining 15% (Flood pers. comm.). Historical data on the quantity and dollar volume of domestic production of binoculars, monoculars, and spotting scopes were not available.

The estimated purchases of imported binoculars were increased by 17.7% to reflect domestic output. In addition, the estimated binocular sales were increased by 6.2% to account for estimated sales of spotting scopes, based on data reported in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). The estimates of gross tax revenues based on estimated sales are included in Table 8.

Table 8. Estimated potential annual sales of, and tax revenue from, binoculars and spotting scopes (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	47.6	0	109.8	0
5%	46.7	2.3	108.7	5.4
10%	45.7	4.6	107.4	10.8

These estimates assumed that future demands for these products would reflect the past trend in purchases of imported binoculars plus the estimated domestic production and spotting scope sales. No data were available for monoculars. Therefore, the potential revenues from binoculars and spotting scopes, shown in Table 8, would be increased by an excise tax levied on monoculars.

A 10% tax on binoculars would reduce the quantity sold by an estimated 4%. Comparable reductions probably would occur for monoculars and spotting scopes, assuming that the demand patterns for these products are similar to those for binoculars.

About 85% of the potential tax revenue would be from duty on imports. The potential tax of 5 to 10% would yield duty of about \$2.0 to \$3.9 million in 1980, assuming that 85% of spotting scopes also were imported.

About half of the total dollar sales of binoculars is to individuals for whom birdwatching is a primary or secondary activity. In addition, as much as 75% of the more expensive binoculars (costing more than \$250 in 1975) were purchased by birdwatchers (Payne and DeGraaf 1975). Thus, birdwatchers would pay a higher percentage of the tax on a per person basis.

The average retail cost of both spotting scopes and binoculars in 1980 was \$57 (Shaw 1983). These products are durable goods generally lasting for several years; therefore, the annualized tax payment was estimated to be \$1 or less. Although this tax payment would be relatively regressive despite the purchase of higher priced products by birdwatchers, the extremely small percentage of annual income spent for the tax on these products would not have a perceptible impact on any income class.

About 85% of binocular production is from foreign sources, and most of the costs of adjusting production downward would probably be borne by foreign producers. Sales generally have been increasing, and the adjustment probably would occur as a reduction in the rate of growth.

#### J. POTENTIAL EXCISE TAX ON WILDLIFE IDENTIFICATION BOOKS

Potential funding from this source would be from a 5 to 10% excise tax on wildlife identification books, levied at the publisher/importer level.

This product is defined by the Library of Congress system (U.S. Library of Congress 1979) under the major heading Zoology (Code QL). The subcategory "Geographic Distribution" is most closely related to "Field Guides".

Retail purchases of wildlife identification books were \$17.96 million in 1980, according to the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). This translates into about \$10 million at publisher/importer prices. Therefore, a 5 and 10% tax in 1980 would have provided \$500,000 and

\$1,000,000, respectively, of tax revenue. Potential tax revenue in the year 2000 could be as high as \$2.0 million at the 5% tax rate and \$4.0 million at the 10% tax rate, based on increases in U.S. population and real income.

Wildlife identification books are imported duty free under the Florence Agreement of 1967. An informal survey of a major book retailer identified 9% of these books as imports. Thus, the potential taxes of 5 to 10% would have yielded about \$45,000 to \$90,000 in duty in 1980. This duty was included in the potential revenue estimated above.

There would likely be little economic efficiency loss associated with a 5% tax on wildlife identification books because of limited substitutes and, therefore, a price-inelastic demand.

A tax on wildlife identification manuals would be regressive, but, on the average, the tax would represent less than one-hundredth of 1% of a typical household's income. Expenditures rise with age until the 45 to 54-year old bracket and then fall to average in the over-65 age bracket.

The benefits received linkage would likely be strong. Tax funds would provide increased opportunities for viewing wildlife; therefore, many purchasers of wildlife identification manuals would benefit directly.

#### K. POTENTIAL USER FEES ON FEDERAL LANDS

Funding from this source would be from potential user fees or surcharges between \$0.50 and \$2.00 on selected Federal land and waters.

Seven Federal land management agencies provide recreational opportunities. It is difficult to estimate potential revenue from user fees because of agency differences in legislative instructions, accounting procedures, attributes of the lands they manage, and access to those lands. Therefore, information drawn from a variety of sources was used to develop the estimates shown in Table 9.

Fifty percent of each agency's user fees was assumed to be available for funding the 1980 Fish and Wildlife Conservation Act. The remaining 50% was assumed to be needed to cover increased costs of administration and capital investments by the agencies. It was estimated that \$103.1 million annual net wildlife enhancement revenue potentially could be generated from new or increased visitor fees under 1980 conditions, increasing by 20% to \$123.6 million annually by the year 2000, based on projected U.S. population growth.

National Park Service visitor fees covered only 2% of National Park Service operation and maintenance costs in 1981. This ratio would be improved if user fees were increased, because 50% of the increased revenue would be available to offset development and administrative costs. More importantly, visitor fees would be an excellent way to link individual charges with benefits received because wildlife enjoyment is an important attribute of most recreation visits to public lands. Visitor fees between \$0.50 and \$2.00 per person



Table 9. Potential revenue from user fees on Federal recreation areas (millions of 1980 dollars).

Federal agency	Potential funds available for wildlife	
	1980	2000
Fish and Wildlife Service	12.2	14.6
National Park Service	15.0	18.0
Forest Service	50.1	60.0
Army Corps of Engineers	7.5	9.0
Bureau of Reclamation	18.3	22.0
Total	103.1	123.6

represent a small portion of the cost of most recreation visits and a very small part of annual income. Therefore, visitor charges would not significantly reduce the number of visits. For uncongested Federal recreation sites, charging a fee in excess of the incremental costs of management would produce a small economic efficiency loss.

#### L. POTENTIAL VOLUNTARY CHECKOFF ON FEDERAL INCOME TAX RETURNS

Potential funding from this source would be from a voluntary checkoff on Federal income tax returns, deductible the following year as a contribution. A voluntary checkoff on Federal income tax returns would be modeled after the State nongame checkoffs. Individuals could donate a portion of their refund (or add to amount owed) to the nongame program.

An equation was developed to predict Federal checkoff revenues based on a statistical evaluation of State nongame checkoff data. The most likely revenue estimate is \$40 million for 1980 and \$54.5 million for the year 2000. Depending on how taxpayers treat a Federal checkoff, compared to State checkoffs, Federal revenue could be less than these estimates and State nongame revenue could drop significantly from the current level.

Because of the voluntary nature of the nongame checkoff, there would be little, if any, excess burden or losses in economic efficiency. However, the voluntary nature of the checkoff means that individuals benefiting from wildlife management programs can avoid paying. This "free riding" behavior would result in below economically optimal levels of funding if a voluntary checkoff were the only Federal funding source.

The voluntary nature of the checkoff ensures that contributors pay no more than their benefits received. Otherwise, contributions would diminish or stop.

Contributions appear to rise with income. However, the sacrifice made by upper income persons in a 50% marginal tax bracket is less than the sacrifice made by persons in a 20% marginal tax bracket because of the deductibility of the contribution in the following year. Although contributions rise as income rises (based on an analysis of Idaho State tax returns), contributions, as a percent of income, appear to fall, making the checkoff regressive. The voluntary nature of the checkoff, however, implies that people must feel able to pay or they would not contribute as much as they do.

#### M. POTENTIAL SALE OF SEMIPOSTAL STAMPS

Potential funding from this source would be from a surcharge for prestige nongame postage stamps, with the contribution equaling 25 to 50% of the postage value. Semipostal stamps are special stamps bearing a surtax in excess of the regular postage. Semipostal stamps have been issued in Europe and Canada, but not in the United States. Surtaxes have ranged from 20 to 100% of the face value (postage) of the stamp, with most of the issues having a 50% surtax. The revenues from the surtax on the stamps in Europe and Canada are usually dedicated to charities or other recognized purposes.

A rough estimate of revenue potential can be developed from sales data from Germany and Switzerland. The Swiss Postal Administration issues "special stamps with surcharge" twice a year. Both issues consist of a series of four stamps with surcharges of 50%. The revenue from the surcharge is used to support childrens' homes and maintain and restore National structures. German semipostal stamps have been sold for a variety of purposes, including Olympic sports and independent welfare groups. German issues are generally in series of four, with surtaxes of 50% of the face value. Annual sales in Germany have been approximately one stamp per citizen; Swiss sales have been nine stamps per citizen. However, sales data may include significant stamp sales to individuals in other countries. Assuming the same range of per capita sales in the United States, approximately 226 to 2,034 million stamps would have been sold in 1980. If the stamps were sold for \$0.20, with a \$0.05 surcharge, potential surcharge revenues would have been \$11.3 to \$101.7 million. A \$0.10 surcharge would have yielded \$22.6 to \$203.4 million. Revenues in the year 2000 are estimated at \$26.7 to \$240.3 million for a 50% surcharge and \$13.4 to \$120.2 million for a 25% surcharge. Net revenues would be less because of advertising costs.

The economic efficiency effects of the surcharge would be limited because the purchase of semipostal stamps would be voluntary. In addition, the stamps would be purchased in small increments and at selected times. Purchases would likely be in line with an individual's perceived benefits because the purchase of semipostal stamps would be voluntary. Purchases would reflect a person's view of their ability to pay, with respect to their income. However, the likelihood of "free riding" of benefits by nonpayers would make sole reliance of this voluntary source inconsistent with the benefits received principal of taxation.

#### N. POTENTIAL EXCISE TAX ON RECREATIONAL DIVING EQUIPMENT

Funding from this source would be from a potential 5 to 10% excise tax on recreational diving equipment including masks, snorkels, tanks, regulators, flippers, wetsuits, and spear guns.

Sales volume data were obtained from the National Sporting Goods Association for the years 1972 to 1983. Potential taxes at the 5% level in 1980 would have yielded \$1.7 million. A potential tax at the 10% level would have resulted in tax revenues of \$3.1 million due to the high price sensitivity of demand. The trend in real sales (sales adjusted for inflation) shows a substantial decrease over the last 10 years. If this trend continues, little tax revenue would be expected in the year 2000.

Imports of underwater breathing devices were \$802,000 in 1980, yielding \$31,278 in revenue under a 3.8% rate of duty. Potential 5 to 10% taxes would yield additional estimated revenue of \$38,000 to \$70,000, excluding potential revenue from other articles, such as wetsuits, for which data were not available. The potential duty of \$38,000 to \$70,000 was included in the potential revenue estimated above.

The price sensitivity of demand for lower priced diving equipment, such as flippers, masks, and snorkels, is less than for high priced items, such as air tanks, regulators, and wetsuits. Therefore, more economic efficiency losses are expected with the higher priced items. Overall, a 10% tax could have a significant economic efficiency loss in terms of excess burden, compared to a 5% tax.

No data were available to quantify the degree of progressiveness or regressiveness of a tax on recreational diving equipment. It would seem likely that the tax would be mildly regressive, based on incomes of users and the range of prices for diving gear.

The benefits received linkage would be positive, but lack of data precludes inferences about the strength of this linkage. Recreational divers would benefit from expenditures of tax revenues by States in several ways, including the acquisition of land or increased public access to areas suitable for diving (because of their habitat and public use value), improvements in water quality (aimed at increasing the number and diversity of fish populations), and increases in the number and diversity of fish seen while diving.

#### O. POTENTIAL EXCISE TAX ON SELECTED PHOTOGRAPHIC EQUIPMENT

Funding from this source would be from a potential excise tax of 1 to 5% on film and photographic equipment, including still cameras [twin-lens reflex, single-lens reflex, Instamatics, instant print (e.g., Polaroid), and lens

shutter cameras] and amateur color and black and white film. Lenses, filters, and tripods used by amateurs also would be included. Industrial and scientific cameras and dental, medical, and industrial film generally would be excluded.

Sales data were obtained that could be used to estimate demand curves for imported 35 mm cameras (which make up about 82% of all 35 mm camera sales and a majority of camera revenue) and for amateur still film sales. These demand curves were used to estimate the tax revenue associated with a 1 and 5% tax (Table 10).

The potential revenue for the year 2000 increases because of the growth in demand for cameras and other photographic equipment. The totals shown in Table 10 include lenses, filters, and tripods used by amateurs. Tables showing potential revenue separately for photographic equipment and film are included in Appendix B.

Table 10. Estimated potential annual sales of, and tax revenue from, certain photographic equipment and film (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	2,531.0	0	10,294.0	0
1%	2,519.6	25.2	10,283.7	102.8
5%	2,482.0	124.0	10,246.4	512.3

In 1980, imports of these products yielded duty of about \$52.9 million under existing tariffs, including duty from still cameras sold to professionals. Potential taxes of 1 to 5% would yield additional duty estimated at about \$6.5 to \$32.0 million. This potential duty was included in the estimated potential revenue from this source (Table 10).

The demand for 35 mm cameras and film is relatively price insensitive; therefore, there would be little loss of economic efficiency due to a potential tax, even at the 5% level. Every dollar of potential tax revenue for cameras would involve an economic efficiency loss of only \$0.02 per dollar of tax revenue at the 5% tax rate. The loss in economic efficiency for film would be less than \$0.005 per dollar of tax revenue at the 5% tax rate. Expenditures on photographic equipment rise with age until the 35 to 44 age class and then fall after age 55. Expenditures on photographic equipment by persons 55 or older are about 25 to 30% below other age classes. In terms of income, a tax

on cameras and photographic equipment would be mildly regressive or nearly proportional. A tax on amateur film would be fairly regressive. In addition, a disproportionate amount of tax would be paid by persons in the 65 years and older category.

About 60% of the expenditures on cameras and photographic equipment, excluding film, are made by persons who have photographing wildlife as their primary or secondary purpose. Approximately 20% of these persons purchased the photographic equipment with photographing wildlife as one of their primary purposes (U.S. Department of the Interior and Department of Commerce 1982). The benefits received linkage would not be quite as strong for film. The results of a survey (Newsweek 1982b) of 35 mm camera owners indicated that 67% of them planned to take pictures of nature; 47% planned to take pictures of wildlife. Only 16% of film expenditures were primarily for photographing wildlife.

#### P. POTENTIAL ASSESSMENT OF CHARGES RELATED TO EXTRACTION OF CERTAIN LOCATABLE MINERALS

Estimates of potential revenue from taxes of 1 to 5% on locatable minerals were impossible to make because production and value data for minerals extracted from the public domain are not available. This lack of data is related to the fact that most locatable minerals are mined under the Mining Law of 1872. This Law authorizes any person to enter public domain lands to explore for and mine valuable deposits of locatable minerals. Once claims have been established, Federal agencies forfeit all jurisdiction and revenue collection potential, because claims are not viewed as Federal land.

One mining industry source estimated that if the production of locatable minerals from the public domain were assessed a royalty equivalent to that charged for nonfuel minerals on acquired Federal lands, the U.S. government would collect about \$120 million annually (Sheridan 1977). This would increase to \$141.2 million in the year 2000 if revenues increased at the same rate as that expected for the U.S. population.

No revenue would have been collected in 1980 if only newly claimed and patented locatables were taxed. This would create a problem for wildlife conservation funding, because revenue would be slow in starting, then grow at an uncertain and variable rate. No information was available on current or historic production of hardrock minerals from public domain lands; therefore, it was impossible to estimate future potential tax revenue from newly claimed land.

Because exploration and depletion of locatable minerals is free of Federal regulation and taxation, economic inefficiencies may be introduced in two ways. First, the mining use receives a cost advantage to the extent that other uses of the same resource may be subject to a tax, fee, or regulation, and resources will be overutilized for mining relative to other potential uses. Second, negative externalities would result to the extent that some social costs would be ignored, such as reductions in environmental quality. These external costs may distort optimal resource allocation between

generations, as well as among contemporary economic units. The distortionary effects of externalities can be reduced and economic efficiency improved to the extent that correctly designed taxes internalize these social costs into the economic decisions of mining firms.

The efficacy of a potential tax in producing revenue for wildlife enhancement, and its relative economic efficiency, depends on the current tax structure, the form of the new tax proposal, and contemporary and intertemporal objectives. The likely effects of alternative tax formulations are summarized in Table 11.

Mining interests would receive only those benefits from wildlife enhancement received by any other citizen. The ability of people to pay a potential tax on locatable minerals depends somewhat on the tax form chosen, as shown in Table 11. If corporations do not pass the increased cost on to consumers through higher prices, either profits or the value of mine deposits are reduced, putting the burden of the tax on corporate owners and stockholders. In this case, a potential tax would be progressive, because stock ownership generally rises with higher income. A tax would be regressive or less progressive if the burden of the tax were passed on to consumers through higher prices, because consumption as a percentage of income falls as income rises. A potential tax generally would be regressive if the portion of household income spent on durable goods containing locatable minerals decreases as incomes rises.

The cost of locatable minerals in most durable goods normally is a small part of the total cost of the good, and durable goods make up a relatively small portion of consumer expenditures. This implies that a tax on locatable minerals would generally not be burdensome to most consumers.

#### Assessment of \$10 to \$25 Claim Renewal Fee Annually

An annual fee for the renewal of claims also would be a potential source of revenue for State wildlife programs. A potential annual fee of \$10 to \$25 per claim is assumed for this analysis. The following discussion explores such an approach.

There were 1,206,678 unpatented claims of record at the end of fiscal year 1980 (U.S. Bureau of Land Management 1981). If a \$10 fee had been paid when filing the required annual affidavit of assessment work for each of those claims, roughly \$12.1 million would have been collected. If \$25 were paid for each claim, \$30.2 million would have been collected. Total claims and estimated potential revenue were assumed to be the same in 2000 as in 1980.

No price elasticity of demand information was available to estimate how an annual claim renewal fee would affect the total number of claims. However, significant reductions in registered claims might be expected because the renewal fees of \$10 and \$25 would represent 10 and 25%, respectively, of the \$100 work a claimant must attest has been completed each year to maintain the claim.

Table 11. Effects of alternative tax formulations on resource use patterns.

Type of tax	Intertemporal distortions	Corporate effects	Consumer effects
<u>Sales Tax</u>			
Constant rate	Lower initial rate of extraction	Fraction of tax absorbed in lower value of deposits	Higher initial price to consumers
Exponentially rising rate	No distortion in pace of extraction	Full tax absorbed in lower value of deposits	Consumer price schedule unaffected
<u>Profits Tax</u>			
On profits only	No distortion in pace of extraction	Full tax absorbed in lower value of deposits	Consumer price schedule unaffected
On profits plus interest income	Slower pace of extraction	Reduced value of deposits	Higher initial price to consumers
<u>Royalty Tax</u>			
	Slower pace of extraction	Reduced value of deposits	Higher initial price to consumers

To offset this reduction in claims and implied dampening of potential revenue, annual registration fees could be paid in lieu of the exploration/development work currently required by work affidavits. The claim holder would not incur higher annual costs and claims would not be reduced as much in number, but the expenditures of claimants would be shifted from mineral development activities to wildlife enhancement.

# Q. POTENTIAL EXCISE TAX ON TRAVEL TRAILERS AND CAMPERS

Funding from this source would be from a potential 1 to 5% tax on travel trailers, including conventional pull-type travel trailers (12 to 35 ft long), fifth-wheel travel trailers, park trailers, folding camping trailers (folding tent trailers) and truck campers, levied at the manufacturer/importer level.

Data from the Recreation Vehicle Industry Association for the years 1970 to 1982 were used to estimate demand equations for travel trailers, folding camping trailers, and truck campers. These equations were used to estimate potential revenue from these units. This revenue was added to estimates of revenue from other travel trailers to yield potential revenue estimates for this source (Table 12).

Table 12. Estimated potential annual sales of, and tax revenue from, travel trailers and campers (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	552.4	0	1,929.9	0
1%	534.4	5.3	1,903.5	19.1
5%	460.0	23.0	1,810.0	90.5

The growth in revenue by the year 2000 comes primarily from travel trailers; decreasing sales are estimated for folding camping trailers and truck campers. Individual tables for each of these three product lines are included in Appendix B. No data were available on imports of travel trailers and campers. Few, if any, of these units are imported, according to industry sources.

Travel trailers, folding camping trailers, and truck campers show a fairly high degree of price sensitivity or price elasticity. The economic efficiency loss associated with a 5% tax would be quite high, averaging about \$0.10 of economic loss for each dollar of tax revenue gained. A 1% tax would have a much smaller excess burden (about \$0.02 per dollar of tax revenue).

A potential tax on these three items would be slightly regressive, bordering on being proportional to income. Expenditures for travel trailers and campers are above average in the 35 to 44 and 65 plus age brackets.



In terms of benefits received, travel trailers, folding camping trailers, and truck campers are used 80 to 90% of the time for recreational purposes. Camping appears to be one of the major recreational uses of these items. About 10% of the people who bought or owned travel trailers, folding camping trailers, or truck campers did so with nonconsumptive use of wildlife as one of their primary purposes (Shaw and Mangun 1984).

#### R. POTENTIAL EXCISE TAX ON MOTORHOMES

Funding from this source would be from a potential excise tax of 1 to 5% on motorhomes, including Type A, Type B (van-camper), Type C (low profile), and Type D (compact) vehicles, levied at the manufacturer/importer level.

Sales volume for the years 1970 to 1982 were estimated from data obtained from the Recreation Vehicle Industry Association. Although no statistically significant demand curve could be estimated, a statistically significant sales revenue estimating equation was developed. Potential tax revenue estimates were obtained by combining the revenue equation with a likely price elasticity figure (Table 13).

Table 13. Estimated potential annual sales of, and tax revenue from, motorhomes (millions of 1980 dollars).

Potential tax rate	1980		2000	
	Net sales	Potential tax revenue	Net sales	Potential tax revenue
0	482.0	0	930.0	0
1%	448.5 to 463.0	4.5 to 4.6	865.4 to 893.0	8.6 to 9.0
5%	321.0 to 390.0	16.0 to 19.5	620.0 to 752.4	31.0 to 37.6

A small number of motorhomes may be imported. These vehicles, if any, would be imported principally for Canada and would be duty free under the Automotive Products Act of 1965. No data were available showing the number or value of these imports.

A fairly price sensitive or price elastic demand for motorhomes seems likely, based on the factors influencing the price elasticity of demand for motorhomes and estimated price elasticities for similar products (travel trailers). The economic efficiency effects of a 5% tax would be significant. The loss of economic efficiency could be as high as \$0.12 per dollar of tax revenue. The economic efficiency loss of a 1% tax would only be \$0.02 per dollar of tax revenue.

Small sample sizes in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) and the U.S. Department of Labor (1978) Consumer Expenditure Survey did not allow a detailed analysis of how expenditures change with income and age. It appears that expenditures on motorhomes rise with income and that 44% of all motorhomes are owned by persons with incomes over \$25,000 (in 1980 dollars). Expenditures do rise with age, up to the 55 to 64 age group. Expenditures by persons over age 65 are below average.

About 80% of the motorhomes are used for recreation. Camping makes up a large percentage of the recreational use. To the extent that States provide camping areas, there would be some benefits received linkage for motorhomes. The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) stated that 8% of the people who bought motorhomes indicated that the nonconsumptive use of wildlife was one of their primary purposes (Shaw and Mangun 1984), although this observation was based on a small sample size.

The absolute amount of tax paid per person buying a motorhome would be large at the 5% tax rate (about \$800 tax on a typical motorhome), compared to most other items being considered for taxation. However, motorhomes are used for several years. The potential annual tax would be about \$80, assuming that motorhomes are used for 10 years (Summers pers. comm.).

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## APPENDIX A. EVALUATION CRITERIA

This appendix describes in detail each of the economic evaluation criteria used in the study.

### POTENTIAL REVENUE

This factor was included as an evaluation criterion because the overall purpose of the Section 12 study was to identify potential sources of revenue for funding State wildlife, especially nongame, programs. These programs may be funded by potential excise taxes on products or from other sources, such as voluntary purchase of semipostal stamps. Potential funding from the latter sources would depend on income levels, preferences for use of available funds, and other factors.

The most significant factor affecting potential excise tax revenue is product sales volume. If sales volume is low, little or no potential revenue is likely. The next most important factor is the sensitivity of quantity demanded to tax-induced price changes. If the quantity purchased by consumers is very sensitive to price, then a tax-induced price change results in a large reduction in the quantity of the good sold. Because tax revenue is received only on the units sold, the larger the decrease in units sold, the smaller the remaining tax revenue. As discussed in the Economic Efficiency section, empirical estimates of price sensitivity were used, when available, to adjust the level of sales for the effect of different tax rates. When such estimates were not available and could not be estimated, a range of likely sales and tax revenue usually was displayed. The level of manufacturer/importer sales for each product was obtained or estimated in order to evaluate this criterion. Three principal sources of sales data were used. The data obtained from each of these sources required different analytical approaches but the objective was the same: to obtain or estimate the sales volume of each potentially taxable product.

The three principal sources of data are discussed below.

#### Census of Manufactures

The Bureau of the Census, U.S. Department of Commerce, conducts the Census of Manufactures every 5 years to obtain information on labor, materials, capital input and output characteristics, plant location, and legal form of organization for all plants in the United States with one or more employees. A complete enumeration of data items was obtained by Census from 205,000 firms

in 1977. Administrative records from the Internal Revenue Service and the Social Security Administration were used to gather information for an additional 145,000 single-unit firms. The data obtained from the 350,000 firm sample records were used to estimate production shipments and other data for all firms.

Census of Manufactures data were used when appropriate data were available. However, the most recent data were for 1977. Therefore, 1980 shipments were estimated using 1977 and earlier Census data, taking into account recent changes in production levels.

The Census data used in this report may include shipments from one company facility to another facility of the same company (interplant transfers). These shipments are not subject to excise taxes. Because data on the value of interplant transfers were not available, the estimated potential revenues based on shipments of products may exceed the actual potential revenues.

#### 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

This 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) was conducted by the Bureau of the Census in two phases. The first phase screened a sample of 116,000 households to determine who in the household had hunted, fished, or engaged in some nonconsumptive wildlife-associated activity in 1980 (95% response rate).

In the second phase, detailed in-person interviews were conducted with subsamples of fishermen, hunters, and nonconsumptive wildlife users identified in the screening phase. A total of 30,300 fishermen and hunters and 6,000 nonconsumptive wildlife users were interviewed. These sample sizes were designed to provide statistically reliable results at the National level for fishing and hunting and at the National and Census geographic division levels for nonconsumptive activities.

The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) tabulated retail purchases, which included both domestic production and imports. Manufacturer/importer shipments were estimated by subtracting retail, wholesale, and transportation markups (margins) from these retail purchases when data were used from this survey.

#### Association Data

The third principal source of data was industry associations. Data provided by the National Sporting Goods Association, for example, were based on responses from 20,000 household units of the nearly 200,000 units maintained as a consumer panel by National Family Opinion, Inc. Data also were obtained from other industry associations, as referenced in the analyses of the potential funding sources presented below. Association data generally reflected retail sales; therefore, the retail, wholesale, and transportation margins were subtracted from these data to estimate manufacturer/importer shipments.

Additional data were obtained from reference documents, other agencies, and individuals. The available data were used to estimate the dollar value of shipments by manufacturers/importers of products. The value of shipments was adjusted to reflect reductions in estimated sales, if any, resulting from a potential tax rate. These adjustments are described below.

## ECONOMIC EFFICIENCY

### Concept

Taxation can have positive or negative effects on allocative efficiency (Musgrave and Musgrave 1980). Allocative efficiency refers to the fact that resources flow to their highest valued uses. That is, a scarce resource, such as labor or water, is allocated to its most productive use or the use that produces the most social benefits to the Nation.

Taxes can interfere with or improve allocative efficiency. If the current level of production of a particular good is considered socially optimal, then a distorting tax, such as an excise tax, may result in some consumers purchasing less of the good or, occasionally, completely switching to another, untaxed good. In this case, introduction of the tax affects consumer choice, moving the consumer from a preferred to a less preferred outcome, as compared to financing in a nondistorting way. This tax "burden" is referred to as "excess burden" because it is a loss of economic well-being beyond the loss associated with the payment of the tax itself. Extensive literature on "optimal taxation" has developed around the notion of minimizing the excess tax burden (Baumol and Bradford 1970; Boadway 1979). The essence of Baumol and Bradford's work is focused on taxing goods that are not very price sensitive; i.e., the quantity purchased by the consumer does not change much with the price increase associated with an excise tax. The concept of price insensitivity also is known as price inelasticity. The idea of setting the level of taxation higher for goods with the more price inelastic demands has become known as the "inverse elasticity rule" or "Ramsey rule" (Boadway 1979).

When there is an upward sloping supply curve and a downward sloping demand curve, the excess tax burden is shared by both producers and consumers. In the short run, the owners of a firm must absorb their share of the excess burden as a loss in profits when input prices are fixed (Due and Friedlaender 1981). In the long run, whether or not owners or input suppliers (e.g., workers and land owners) bear any tax burden depends on whether or not management and other inputs are specialized to the industry. If the inputs can be used in other industries, these inputs can flow to nontaxed industries and produce approximately the same income as before (Pechman and Okner 1974). In this case, no burden remains on the producer in the long run. The situation is reversed if these conditions do not hold. The presence or absence of conditions under which firms are likely to bear any burden of the excise tax is noted in the narrative on each product.

This study evaluated the price elasticity of demand for the identified products. Taxes on goods that are price insensitive minimizes the excess

burden, and the long run revenue potential is higher because consumers of these types of goods usually do not stop purchasing a good when it is taxed. Price elasticity information was used, when available, to evaluate this aspect of the efficiency criterion. When such data were not available, price elasticity information was calculated from demand studies of the goods in question. The amount of excess burden was estimated and compared with the tax revenues generated when possible. The ratio of excess burden to total tax revenue also was estimated, based on available data. This percentage is useful in reviewing the potential taxes according to the smallest efficiency cost.

The more price inelastic the good is, the higher the optimal tax rate (Baumol and Bradford 1970). This principle may guide the selection of the appropriate tax rate from the identified range. The percent excess burden of a tax can be thought of as the loss of economic well being by consumers (and sometimes producers) not captured as tax revenue. For example, a 5% excess burden represents a \$0.05 per dollar loss in economic efficiency per dollar of tax revenue. This dollar volume is a leakage because it is neither captured as tax revenue nor retained by producers or consumers.

#### Quantification of Excess Burden

The quantification of the change in quantity demanded and excess burden due to the potential excise tax proceeded along several lines. A computerized data base search for information on price elasticities or demand curve estimates was made. Several data bases were searched, including economic abstracts, dissertation abstracts, and the Government Printing Office. Only a few of the sources searched provided useful information on price elasticities or demand curves for the products being studied.

Given the lack of existing studies on price elasticities, searches were made for raw data that could be used for statistical estimates of product demand curves and price elasticities. A minimum of 8 years of price and quantity data on a product was sought, but more than 15 to 20 years of data were desirable to produce statistically reliable demand equations. Such data series were obtained for a few products or product components. Statistical estimates for these specific products are discussed in Appendix B.

Two stage least squares regression analyses were used to estimate both demand and supply when the quantity of a product consumed was primarily from domestic manufacturers. Insignificant variables, other than price and income, were dropped from the demand curve. Price and income were retained regardless of their statistical significance because they are important variables in economic theory and the statistical lack of significance of these variables was often the result of high multicollinearity between price, income, and other independent variables. The statistical consequences of leaving out a significant variable (even when insignificance is indicated in the statistical analyses) can be severe (Kelejian and Oates 1974). Including a truly insignificant variable carries little penalty beyond the loss of degrees of freedom.

When the supply curve had a negative sign on price of a product or resulted in substantial error in estimates of the quantity supplied in 1980,



it was assumed that the excise tax was entirely shifted to the consumer in the long run. Pechman and Okner (1974) and Musgrave and Musgrave (1980) also assumed that excise taxes are shifted to consumers in the long run.

The majority of the estimated demand and supply equations were statistically significant at acceptable levels. The demand (and occasionally the supply) equations sometimes had acceptable  $R^2$  values even when the crucial price variable was insignificant. The equations were used even when the price coefficient was insignificant at the 90% level, because the insignificance often was due to multicollinearity, making the true significance difficult to determine. In addition the equations provided insight into price-related behavior and excess burden when information on elasticity was not available, and enhanced revenue forecasting.

When no empirical estimates on price elasticity of demand, demand curve estimates, or data to estimate such curves were available, the factors that influence price elasticity were used in the analyses. Several factors influence price elasticity, including closeness of substitutes, whether the good is a luxury or a necessity, and percent of income spent on the good (Hirshleifer 1976). The likely reduction in demand and the excess burden from the tax was calculated from these factors, using formulas developed by Revier (pers. comm.). Because application of these four factors can, at best, suggest a likely range of price elasticities, the corresponding range of sales and tax revenue usually is displayed.

#### Excess Benefit

Taxes on goods used in leisure time activities may reduce the excess burden associated with an income tax (Boadway 1979). A tax on this type of goods can be viewed as an indirect tax on leisure, which helps correct the distortion of an income tax in the labor-leisure tradeoff. Many of the products studied are leisure goods, resulting in the possibility of overall reductions in excess tax burden. The extent of the possible reduction is limited because not all leisure goods would be taxed. Thus, some distortion between the relative prices of different leisure goods may exist.

When the current level of output of a particular good is too large, taxes may reduce the output, making it closer to the social optimum because spillover costs are internalized in the producer's or consumer's decisionmaking (Mishan 1971; Due and Friedlaender 1981). The improvement in allocative efficiency due to a tax and the resulting redirection of resources from a lower valued use to a higher valued use is known as "excess benefit" (Terkla 1984).

This study applied the concept of excess benefit by evaluating the presence and degree of externalities associated with the production and/or consumption of a good. This assessment was qualitative or quantitative, depending on the available data. The effect of a tax, in terms of reducing negative environmental impacts associated with production, may have a strong complementary effect with wildlife habitat and population management programs financed by the tax revenue. This potential effect was noted in the product analyses.

## BENEFITS RECEIVED

The principle that the taxes paid by an individual should correspond to the benefits the individual receives from government services dates back to Adam Smith's The Wealth of Nations (Cannon, ed. 1904). The benefits received principle also relates to the current concept of fairness of a tax or a just tax. The basic idea is that those who benefit the most from a government-provided service should pay more than those who use the government service very little.

"Because wildlife has public values, there also exists public rights, and the responsibility to protect these rights forms the doctrine of public trust" (Brokaw 1978:293). The public trust doctrine assigns the ownership rights and responsibility to protect wildlife resources to State governments and the Federal government. Wildlife resources are to be used in the best current and future interest of the general public, rather than for maximizing profits. In a broad sense, taxation of certain items to fund State wildlife conservation programs enables States to carry out their responsibilities under the public trust doctrine more effectively. Many landmark court cases affirm the public benefits received from wildlife over the interests of a private party. The general public benefits from wildlife resources include public access for viewing, photography, and recreation, as well as hunting or fishing in accordance with State and Federal laws. The States and the Federal government have the responsibility to conserve wildlife resources for future generations under the public trust doctrine. Therefore, tax revenues also would increase the ability of the States to carry out their wildlife-related responsibilities to future generations.

Available data on the types of expenditures made under "nongame" programs in States having an income tax checkoff program indicate that the public, as a whole, benefits from these expenditures. Public access for recreation is improved, facilities are provided for a broader spectrum of citizens to visit wildlife or open space areas, and habitat protection or enhancement occurs that avoids further wildlife losses. Checkoff receipts are used for environmental interpretation or education in some States. Tax-supported education has a long tradition of providing public benefits.

Any increase in tax revenue devoted to natural resource management has the potential to increase public benefits. However, the benefits received criterion requires information regarding which taxable items have the strongest link between beneficiaries and payers of the tax. Birdwatchers, nature photographers, campers, and hikers benefit directly from increased or improved management of wildlife resources. The protection of wildlife habitat also can result in improved management of open spaces in urban-suburban areas and improvements in the environmental quality of rural lands. There are many indirect beneficiaries of government expenditures to manage wildlife habitat. Krutilla (1967) and Brookshire et al. (1983) pointed out that many people derive satisfaction from just knowing that wildlife exists. These persons often are willing to pay to know that wildlife will continue to exist in a given area. These "existence" benefits are very diffuse across the population as a whole.

The above factors were considered when analyzing the benefits received criterion. However, the emphasis was on the linkage between the tax paid and the activities for which the funds would be used. Any tax can generate existence values. Therefore, the factor used in evaluating the specific benefits of a product was the percentage of purchasers who use the good for wildlife-related or wildlife-funded activities and the percentage of the tax paid by those purchasers. The purchases of goods, used primarily or secondarily in wildlife observation or other activities using lands acquired by nongame funds, can be compared with total industry sales for many tax revenue sources. If expenditures for a certain good used for wildlife observation are a significant portion of the total sales, then a tax on that good may correspond to a tax "in lieu of charges" application of the benefits received criterion (Musgrave and Musgrave 1980). This approach recognizes the difficulty of paying a fee per bird sighted, for example, and instead relates the level of benefits to the expenditure on the goods necessary for that activity.

The other side of the benefits received linkage is whether or not people who do not buy a taxed good can still receive the benefits of wildlife management financed by a tax paid by others. The benefits received linkage is not complete if anyone can participate in an activity without buying the taxed good, even if everyone who buys the taxed good also participates.

#### ABILITY TO PAY

When direct beneficiaries of government expenditures cannot be identified (as in the case of National defense or the space program) or society chooses not to tax on the basis of benefits received, the ability to pay criterion is often used to evaluate the fairness or equity of a tax.

The ability to pay criterion indicates the relative sacrifices in material well-being made by individuals subject to a given tax. The effect of a tax depends on how the tax burden is distributed by income class. A tax generally is considered equitable if equal sacrifices are made by taxpayers at all income levels. Assuming that income level is an acceptable measure of material well-being, the equity of a potential tax can be measured by the percent of income paid as taxes. The tax is considered progressive if the percentage of income paid as taxes rises as income increases. If the percentage of income paid as taxes decreases as income increases, the tax is considered regressive. If the taxes paid remain a constant percentage of income regardless of income level, the tax is considered proportional to income.

In this study, the term income is defined consistent with the Bureau of Census definition of "money income". This is an annual measure of current before tax income, which includes wages, salaries, interest income, rental income, and cash transfer payments (U.S. Bureau of the Census 1984). However, a difficulty arises when using current income to evaluate ability to pay for long lived durable goods. For many durable goods, expected lifetime income may be a better indicator. Unfortunately, such measures of income are not available.

The fact that a tax on a particular item would be regressive should not automatically preclude its consideration (Due 1964). As long as the progressive nature of the income tax system dominates, adding a regressive tax on a minor item does not seriously reduce the overall progressiveness of the tax system.

There are several summary indices that measure the degree of tax progressiveness (Musgrave and Musgrave 1980). One index that is widely used is the Suits Index or Suits Index (Suits 1977). This index compares the percentage of a tax paid by each income class to the percentage of the National income received by that income class. A tax is proportional (Suits Index = 0) if the tax payments for each income class are proportional to the percentage of National income received by that class. When the Suits Index = 1, the tax is extremely progressive. When the Suits Index = -1, the tax is extremely regressive. The closer the Suits Index is to zero, the more it approximates a proportional tax.

There are drawbacks to the use of any of the available indices. First, if a tax is regressive through most income classes but progressive or proportional through one or two income classes, this variation will not be apparent from the index because the index only indicates the overall degree of progressiveness. Second, available indices reflect the relative burden among income classes and omit the burden within an income class. When the burden on typical buyers within an income class is an important distinction, it is highlighted in the discussion in Appendix B.

Two data sources were used to calculate the Suits Index. The only data set available for many wildlife or outdoors-related goods (e.g., bird seed, other bird products, and binoculars) was the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). The reported expenditures for the portion of the survey related to nonconsumptive uses of wildlife were related to income classes.

The data source for more general items (e.g., photographic equipment, fur clothing, camping equipment, and travel trailers) was the 1973 Bureau of Labor Statistics Consumer Expenditure Survey (U.S. Department of Labor 1978). This survey was used to help compute the Consumer Price Index. The Consumer Expenditure Survey is used by public finance analysts when evaluating the effect of excise taxes (Brownlee and Perry 1967; Calmus 1970; Rock 1983).

In describing the distribution of the tax burden, the terms "low" or "high" income taxpayers often are used. These terms are generally used to refer to households or taxpaying units with incomes below \$10,000 (in 1980) or above \$50,000 (in 1980), respectively.

## APPENDIX B. EVALUATION OF POTENTIAL FUNDING SOURCES

This appendix contains information on the 18 potential funding sources studied in detail.

### A. ANNUAL GENERAL FUND APPROPRIATION

#### Product/Source Definition

Funding from this source would be by annual appropriation, as agreed to by Congress and the Administration.

#### Funding Potential

Potential appropriations from the general fund for nongame wildlife programs have both advantages and disadvantages. The primary disadvantage occurs when revenue requirements for "uncontrollables" in the Federal budget make stable funding for nongame wildlife programs unlikely. Efforts to control the Federal deficit are likely to continue to preclude new Federal appropriations for nongame wildlife in the near term.

An advantage of the annual appropriations process, however, is that it provides a flexible way for Congress to change the level of funding for nongame management consistent with the perceived needs for wildlife management and other competing National priorities.

#### Economic Efficiency

The effects on efficiency in resource allocation and labor-leisure trade-offs associated with income taxes depend on the source of general appropriation funds. The funds for nongame management could come from redirection of existing government expenditures from programs Congress deems as currently providing less of a return on the taxpayers' dollar. That is, as the Nation's needs change, some programs are decreased and new ones initiated. If nongame general appropriations came from redirection of currently obligated funds, no new excess burden may be generated.

If additional funds must be raised, the type of taxation would influence the amount of excess burden. More than half of all Federal revenues come from taxes on labor income (Aaron and Pechman 1981). Estimates of the excess burden per dollar of tax revenue derived from labor income range widely. Studies by Browning (1976) indicated the percentage of excess burden as ranging from 9 to 16%. More recent estimates, reported in Aaron and Pechman (1981),

estimated average excess burden as 22%. Although work by Stuart (1984) confirms this 22% level, he notes that when the tax funds are used to finance government consumption (purchase of goods or services rather than transfer payments to individuals), the percentage of excess burden can be as low as 7.2%. The lower 7% figure would seem to apply because the nongame funds would be used to finance purchases (by State wildlife management agencies) of land, materials, and labor skills necessary for wildlife management.

### Benefits Received

The economic rationale for use of general appropriations is that the benefits of a particular government program, in this case nongame wildlife management, would be so widespread among the entire population that identification of specific beneficiaries would be difficult. In evaluating the benefits of a nongame wildlife management program, a large portion (but not all) of the benefits appear to be widespread throughout the population. The diffuse benefits include "existence values" people derive from just knowing that wildlife exist in their natural habitats (Krutilla 1967; Brookshire et al. 1983). In addition, over half the U.S. population over the age of 16 engages in some form (passive or active) of nonconsumptive use of wildlife (U.S. Department of the Interior and U.S. Department of Commerce 1982). These "uses" range from passive observation of wildlife when around the home or traveling to outings to wildlife refuges for the primary purpose of viewing or photographing wildlife.

Annual appropriations are designed to finance government programs when most, if not all, of the benefits fit the existence category or are very diffuse. All persons receiving these benefits contribute on the basis of ability to pay because the existence benefits received are difficult to measure from individual to individual. The compulsory nature of income taxes tends to ensure that beneficiaries do not "free ride" on others by not paying for but still receiving the benefits. Financing of nongame wildlife management solely from appropriated funds would not be consistent with the benefits received principle of taxation because citizens who visit wildlife refuges or National Forests receive benefits in addition to existence values.

### Ability to Pay

Individual income tax rates at the Federal level generally are progressive, even with the many possible deductions and exemptions (Musgrave and Musgrave 1980). The degree of progressiveness, using the Suits Index (Suits 1977), is +0.19.

Corporations pay 15 to 20% of all Federal taxes (Musgrave and Musgrave 1980), and the question of who bears the tax burden of the corporate income tax may be important. Most analyses indicate that the owners of capital in both the corporate and noncorporate sectors bear most of the tax burden. The percentage of capital income as a fraction of total income rises as total income increases, and any increment to corporate income tax would be quite progressive. The Suits Index for corporate income taxes is +0.32 (Suits 1977). If the corporate income tax is partially shifted to workers and consumers, it is almost proportional (Musgrave and Musgrave 1980).

B. EXCISE TAX OF 5 TO 10% ON WILD-BIRD SEED LEVIED AT THE MANUFACTURER/  
IMPORTER LEVEL

Product/Source Definition

This potential funding source involves wild-bird seed; seed for domestic animals is excluded.

Funding Potential

Price elasticity data and data series on quantities sold and value of wild-bird seed, including seed imports, were not available. Therefore, a demand equation could not be estimated. Limited data were available that could be used to estimate wild-bird seed sales. Unpublished data, collected in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982), indicated that 617 million pounds of wild-bird seed were purchased in 1980 (Shaw 1983). George et al. (1982) surveyed wild-bird seed manufacturers to obtain estimates of the total value and pounds of wild-bird seed sold in 1979. Values ranged from \$0.084 to \$0.17 per pound, with a median value of \$0.127. This median value is similar to estimates by bird seed manufacturers of unmixed bird seed valued at \$0.10 per pound in 1979 (George et al. 1982).

The \$0.127 per pound manufacturers' estimate is consistent with the value of all bird feed (wild, tame, pigeon, and game), excluding poultry feed, reported in the 1977 Census of Manufactures (U.S. Department of Commerce 1980). The 1977 Census reported shipments of 168,200 short tons of bird feed, valued at \$33.8 million. These data reflect a value of \$0.10 per pound, an increase of \$0.048 (\$0.01 per pound average increase per year) over Census values for 1972 (U.S. Department of Commerce 1980).

Taking into account the median value of \$0.127 per pound of wild-bird seed in 1979, the \$0.10 per pound for unmixed bird seed in 1979, the \$0.10 per pound value for shipments of all bird feed in 1977, and the average increase in value of about \$0.01 per year since 1972, the producer's value of wild-bird seed in 1980 was estimated at \$0.13 per pound. Multiplying the 617 million pounds of wild-bird seed reportedly purchased in 1980 by the estimated value of \$0.13 results in estimated manufacturer shipments of approximately \$80.2 million.

George et al. (1982) estimated that at least \$90 million worth of shipments were made in 1980 by the bird products industry. Assuming that 88.1% of industry shipments is bird seed, based on manufacturers' estimated seed sales (George et al. 1982), the wholesale value of bird seed was \$79.3 million. After adjustment for a 5% markup by wholesalers (George et al. 1982), estimated manufacturer shipments were \$75.5 million. This is 5.8% less than the \$80.2 million estimate based on the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) and other data.

The various adjusted estimates were quite similar.

<u>Study</u>	<u>Estimate of manufacturers shipments (millions of 1980 dollars)</u>
Current study estimate, based on pounds purchased at retail as reported in the <u>1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation</u> (U.S. Department of the Interior and U.S. Department of Commerce 1982)	\$ 80.2
Estimated based on 1980 shipments estimated by George et al. (1982) from their survey of manufacturers	\$ 75.5
Estimated manufacturers' shipments in 1974 based on DeGraaf and Payne (1975) National survey of manufac- turers (adjusted to estimated 1980 price)	\$146.2

George et al. (1982) stated that 1973 was the best year for the wild-bird products industry, but sales declined in 1974 and remained down for several years. These authors also noted that mild winters can affect sales and that sales were lower during the winter of 1979-1980. Thus, the data estimated for 1974 and 1980 may reflect the effect of cyclical or seasonal factors.

The estimated value of \$80.2 million reflects the quantity purchased, as reported in data collected in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). This estimate was used to evaluate the potential revenue from a tax on wild-bird seed.

If a price elasticity of 1 is assumed (see Economic Efficiency section), the decrease in wild-bird seed sales can be estimated: a 5% tax would result in a 5% reduction in the quantity sold. Therefore, gross sales remain unchanged. Net sales were calculated by dividing gross sales by one plus the tax rate. The difference between gross and net sales is the potential tax revenue (Table B-1).

Gross sales projected for the year 2000 were based on per capita purchases in 1980 multiplied by the predicted population for the year 2000. These gross sales estimates do not assume, in the absence of a demand equation, that real income increases by the year 2000 would result in additional per capita purchases of wild-bird seed. If higher future incomes are realized and translated into increased purchases, then increased potential tax revenue would result.



Table B-1. Estimated potential annual sales of, and tax revenue from, wild-bird seed (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	80.2	80.2	0	94.4	94.4	0
5%	80.2	76.4	3.8	94.4	89.9	4.5
10%	80.2	72.9	7.3	94.4	85.8	8.6

The potential tax revenue estimates in Table B-1 include sales of imported wild-bird seed, such as niger (thistle) seed, which is classified under item (category) 127.10 of the Tariff Schedules of the United States (U.S. International Trade Commission 1983a). However, item 127.10 also includes other garden and field seeds that are not birdseed. Specific data were not available showing the imports of niger nor were data available for other wild-bird seed imports (Roeder pers. comm.). However, data were obtained which enabled an estimate of niger imports to be developed, followed by an estimate of all wild-bird seed imports and the duty obtained from those imports.

About 22 million pounds of seed were imported under item 127.10 in 1980, of which about one-fourth, or 5.5 million pounds, was niger. The rate of duty for imports under item 127.10 was \$.015 per pound with no change scheduled in the future for this tariff (Roeder pers. comm.). Multiplying the estimated 5.5 million pounds of niger imported by \$.015 per pound yielded estimated tariff revenue of \$82,500 from niger seed in 1980.

A representative of the wild-bird seed industry stated that about 1 to 2% of wild-bird seed is imported (Frank pers. comm.). About 617 million pounds of wild-bird seed were purchased in 1980 (Shaw pers. comm.), based on responses to the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). Multiplying the 617 million pounds by 1 to 2% yielded estimated imports of 6.2 to 12.3 million pounds, assuming that 1 to 2% was imported in 1980. Multiplying the estimated 6.2 to 12.3 million pounds by the duty rate for niger of \$.015 per pound yielded an estimated tariff revenue for all wild-bird seed imports of \$93,000 to \$186,000. The \$93,000 may compare with the \$82,500 estimated above for niger alone, based partially on different data. Based on this comparison, the range of duty collected in 1980 from wild-bird seed was estimated at about \$93,000 to \$186,000, assuming that niger is the principal wild-bird seed import and that the rate of duty for niger can be used to approximate the unknown duty rates for any wild-bird seed imports other than

niger. Assuming that the duty collected was the median (\$139,500), the added duty estimated for State wildlife programs under potential 5 to 10% tax rates would be about \$60,000 to \$120,000, assuming reductions in import sales would be proportional to domestic production losses. This added duty was included in the potential tax revenue estimated above. The duty actually collected on wild-bird seed imports in 1980 may differ substantially from this estimated range but data are not available on these imports.

Wild-bird seed packaged for retail sale, which contains byproducts obtained from the milling of grains, mixed feeds, and mixed-feed ingredients, is imported duty free (Newman pers. comm.; U.S. International Trade Commission 1983a). Thus, no tariff revenue was estimated under existing duty rates for packaged wild-bird seed.

The estimated import revenues would increase by the year 2000, based on increasing gross sales and assuming that the duty rate is unchanged.

### Economic Efficiency

Data on price elasticities and demand curves or information that could be used to estimate a demand curve were not available for wild-bird seed, and the decrease in the quantity of wild-bird seed sold resulting from a tax could not be estimated. Therefore, the economic efficiency effects of the tax were evaluated based on the four factors that influence price elasticity (Hirshleifer 1976). Ability to pay data (U.S. Department of the Interior and U.S. Department of Commerce 1982) indicated that annual bird seed expenditures represent less than 1% of income and that expenditures do not rise with income. Therefore, the income effect is probably small. The substitution possibilities for wild-bird seed are somewhat limited (Harrison 1979), although certain cereal grains (e.g., corn, millet, and wheat) are widely available. Unless a close substitute for wild-bird seed was developed after the tax, the percent reduction in quantity demanded should be slightly less than the percent increase in price due to the tax (i.e., the price elasticity for bird seed appears to range from slightly price inelastic to unitary elasticity). Assuming no close substitute and no factors of production solely applicable to the wild-bird seed industry, a 5% tax would reduce the quantity demanded by approximately 5%. One manufacturer indicated, during Congressional testimony on the 1980 Fish and Wildlife Conservation Act (U.S. Congress 1980), that the percent change in quantity sold was equal to the percent change in price.

It is unlikely that there will be substantial economies of scale in the production of wild-bird seed. Therefore, the economic burden on producers would be limited to the few years it would take firms to adjust to the tax. In the long run, consumers would bear the entire burden of the tax.

The economic distortion associated with a potential 5% tax on wild-bird seed, in terms of percentage of excess burden, would be 2.6% when the price elasticity equals 1. The absolute magnitude of the distortion would be about \$100,000 per year when the price elasticity equals 1 and the tax rate is 5%, or \$0.026 of economic distortion per dollar of tax revenue. If the demand was more price inelastic, the percentage of excess burden would be less. With a 10% tax rate, the percentage of excess burden would be 5.5%.

## Benefits Received

The benefits received analysis for bird seed is included below with that for other wild-bird products.

## Ability to Pay

The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) included data on wild-bird seed expenditures. The average retail expenditure was \$21.76 in 1980. With a 10% tax at the manufacturers' level, this would equal a \$1 tax payment per person per year. This is a fairly regressive tax because the absolute expenditure, although low, does not rise significantly with income. Expenditures rise with age; the 65+ age bracket has the highest expenditure in both lower and higher income brackets. In the middle income bracket, individuals in the 45 to 64 age bracket spend the most. The Suits Index is -0.376, which is the most regressive of any item studied. The long run tax burden would be borne primarily by consumers; therefore, the ability of firms to pay is not discussed.

C, D, and E. EXCISE TAX OF 5 TO 10% ON WILD-BIRD HOUSES, FEEDERS, WATERERS, BATHS, AND HEATERS, LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

## Product/Source Definition

These potential revenue sources include wild-bird houses, feeders, waterers, baths, and heaters; domestic bird products are excluded.

## Funding Potential

Price elasticity data and data series showing the historical quantities sold and value of these products were not available. Thus, demand equations were not available and could not be estimated.

Wild-bird houses. Participants in nonconsumptive wildlife-related activities spent about \$20.2 million for birdhouses and nesting boxes in 1980, based on the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982).

There generally is a 5% price increase in these products between manufacturers and distributors, a 25% markup between distributors and retailers, and as much as a 50% markup at the retail level (George et al. 1982). These markups were assumed in the analysis of retail purchases of birdhouses and nesting boxes. A computer program was used to convert these pricing relationships into reverse sequential order, beginning with retail expenditures. Application of this procedure resulted in an estimate of manufacturer/importer shipments of \$10.3 million in 1980. Sales for the year 2000 were estimated at \$12.1 million, based on 1980 per capita purchases without adjustment for real income increase, in the absence of a demand equation.

Wild-bird feeders. Participants in nonconsumptive wildlife-related activities spent about \$54.7 million for bird feeders in 1980, based on the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). Using the price markups estimated by George et al. (1982) for wild-bird products, manufacturer/importer shipments of bird feeders were estimated at \$27.9 million in 1980. Sales of \$32.8 million were estimated for the year 2000, based on 1980 per capita purchases, unadjusted for increasing real income, in the absence of a demand equation.

Wild-bird baths. Participants in nonconsumptive wildlife-related activities spent approximately \$25.9 million for wild-bird baths in 1980, based on the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). Using the price markups estimated by George et al. (1982) for wild-bird products, manufacturer/importer shipments of bird baths were estimated at \$13.2 million in 1980. Wild-bird bath sales of \$15.5 million were estimated for the year 2000, based on 1980 per capita purchases unadjusted for increasing real income, in the absence of a demand equation.

The following formula was used to adjust gross sales for the effect of different tax rates:

$$\frac{\% \Delta GS}{\% \Delta P} = 1 + P_{ED}$$

where  $P_{ED}$  = Price elasticity of demand

GS = Gross sales

P = Price

$\Delta$  = Change

Substituting the assumed price elasticity of -2 (see Economic Efficiency section, below) for wild-bird houses:

$$1 + (-2) = -1$$

Assuming passthrough of the entire tax to the consumer (Pechman and Okner 1974), a 5% tax would yield a 5% change in price, with gross sales falling by 5% to \$9.8 million. Net sales are calculated by dividing new gross sales (\$9.8 million) by one plus the tax rate. The price elasticity of -2 also was assumed for wild-bird feeders and baths (Table B-2). The range shown in this table reflects a range in price elasticity from -1 to -2 (see Economic Efficiency section below).

Table B-2. Estimated potential annual sales of, and tax revenue from, wild-bird products (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
<u>Wild-bird houses</u>						
0	10.3	10.3	0	12.1	12.1	0
5%	9.8 to 10.3	9.3 to 9.8	0.5	11.5 to 12.1	11.0 to 11.6	0.5
10%	9.3 to 10.3	8.5 to 9.4	0.8 to 0.9	10.9 to 12.1	9.9 to 11.0	1.0 to 1.1
<u>Wild-bird feeders</u>						
0	27.9	27.9	0	32.8	32.8	0
5%	26.5 to 27.9	25.2 to 26.6	1.3	31.2 to 32.8	29.7 to 31.3	1.5
10%	25.1 to 27.9	22.8 to 25.4	2.3 to 2.5	29.5 to 32.8	26.8 to 29.8	2.7 to 3.0
<u>Wild-bird baths</u>						
0	13.2	13.2	0	15.5	15.5	0
5%	12.5 to 13.2	11.9 to 12.6	0.6	14.7 to 15.5	14.0 to 14.8	0.7
10%	11.9 to 13.2	10.8 to 12.0	1.1 to 1.2	14.0 to 15.5	12.7 to 14.1	1.3 to 1.4

Data were not available for wild-bird waterers or heaters. Thus, the revenue from a potential excise tax on these products is unknown.

Wild-bird houses, feeders, and baths are classified in the Tariff Schedules of the United States as item 207.00 Articles not specially provided for, of wood; 511.61 and 511.71 Articles, including terrazzo, of concrete, with or without reinforcement, not decorated or decorated; and 774.55 Articles not specially provided for, of rubber or plastics (U.S. International Trade Commission 1983a). Duty rates on imports of these items vary from 4.9 to 6.2%

for all countries except certain Communist or Communist-controlled countries. Importation of these products from Communist countries would be taxed at 33.3 to 80.0%.

Individuals knowledgeable about this industry indicated that imports comprise an insignificant share of the market in the United States (Frank pers. comm.; George pers. comm.; Hyde pers. comm.). Similar levels of imports were assumed for wild-bird waterers and heaters (Hyde pers. comm.). Based on this information, no significant revenues from import duties on these products were estimated for 1980 or 2000, either under existing duty rates or with the potential levy of an excise tax for State wildlife programs.

#### Economic Efficiency

No price elasticity or demand information were obtained from the literature nor were data found that could be used to statistically estimate these values. Therefore, only a qualitative estimate of the range of price elasticity was possible. Three of the four factors that influence price elasticity (closeness of substitutes, importance of commodity, and high priced good) indicate that the demand for these products is not very price sensitive. However, the product is not often considered to be a necessity, which would indicate a fairly price sensitive demand. The first three factors would significantly limit any price elasticity relative to the fourth factor. An elasticity of 1.0 to 2.0 would seem likely and would imply minimal economic distortion due to a 5% tax. The percentage of excess burden relative to tax revenue at a 5% tax rate should not be above 6% but could be as much as 12% with a 10% tax and a price elasticity of 2.

#### Benefits Received

A potential excise tax on wild-bird products would be associated positively with the benefits received concept of taxation. According to Boggis and Hamilton (in press), about 55% of the projects in the 31 States with a nongame checkoff were related to birds. One difficulty in determining the benefits received linkage is that there are up to 600 species of birds that could be helped by funding under the 1980 Fish and Wildlife Conservation Act. Public comments (Appendix D) indicated that considerably fewer species are attracted to bird feeders, houses, or waterers. However, if interest in feeding birds that are attracted to tax items indicates an overall interest in birds, then the benefits received linkage would be strong.

#### Ability to Pay

The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) reported average per person retail expenditures on wild-bird feeders, houses, and baths for 1980 as \$9.95, \$14.54, and \$14.30, respectively. A 10% excise tax at the manufacturer level would result in about \$0.50 to \$1.00 tax paid per person per year. Expenditures on wild-bird feeders increase with age, but there is no discernible age pattern for purchases of bird houses and baths. A potential tax on these products would represent less than 0.001% of

income, but it would have a regressive pattern. The Suits indices for wild-bird feeders, houses, and baths are -0.23, -0.253, and -0.32, respectively, reflecting a fairly strong degree of regressiveness.

F. EXCISE TAX OF 5 TO 10% ON WILD-ANIMAL FURS, LEVIED AT THE POINT OF THEIR PURCHASE FROM TRAPPERS

Product/Source Definition

This potential funding source includes furs or pelts from wild animals trapped or killed in the United States. Furs from animals raised on farms or ranches and all imports were excluded.

Funding Potential

Demand curve or price elasticity data for wild furs were not available. Data were sought from several sources that could provide the basis for estimating the price elasticity of these commodities, including individuals at the Statistical Reporting Service, U.S. Department of Agriculture; U.S. Department of Commerce, Bureau of the Census, International Trade Association; Seattle Fur Exchange; and the International Association of Fish and Wildlife Agencies, Fur Resources Council. Data were located in North American Furbearers (Deems and Pursley 1978) on both the quantity and value of the North American fur harvest, by species, for the 1970-1971 through the 1975-1976 seasons. Data for the 1976-1977 and 1977-1978 seasons also were obtained for all species. In addition, partial data for the 1978-1979 and 1979-1980 seasons were obtained for selected species. These data came from several sources, including fur buyer and trapper reports, pelt tag records, bounty records, and mail surveys. The harvest data reflected variable species identification, because scientific names were not included in the survey and the common names of species sometimes differ by State or other geographic area. The dollar values of the pelts reflected the average values calculated from major fur auction averages. The value of direct sales by trappers to other buyers were not included.

Statistically acceptable demand and/or supply curves could not be developed from the price and quantity data from 1971-1980 for the six most important wild fur species (beaver, muskrat, mink, coyote, red fox, and raccoon). However, an equation relating the trend in real sales for these six species to population and income was developed:

$$\text{Real sales per million population} = -2709681 + 759.8\text{INC} \\ (7.27)^{***} \quad (8.33)^{***}$$

$$F \text{ value} = 69.3^{***} \quad R^2 = 0.89$$

$$DW = 2.48$$

where INC = real per capita disposable personal income in 1972 dollars

DW = the Durbin-Watson statistic (Kelejian and Oates 1974)

\*\*\* = statistical significance at the 99% level

Population enters the model through the per capita term. The overall equation and individual variables are all significant at the 99% level. This equation was used to project real fur sales in the year 2000. The species represented in the equation accounted for about 10% of all fur sales in 1980. Thus, caution should be exercised in generalizing this trend to all species.

#### Estimated Sales and Tax Revenue

The fur harvest during the 1979-1980 season resulted in sales of \$294.5 million (Deines pers. comm.). Because of the large increases (a near doubling) in real disposable personal income forecasted by the year 2000 and projected population increases, real fur sales are predicted to increase to \$1491.8 million. The price sensitivity or elasticity of demand is assumed to be in the range of 3 to 5 (see Economic Efficiency). The sales and tax revenue estimates for wild furs are listed in Table B-3.

Table B-3. Estimated potential annual sales of, and tax revenue from, wild-animal furs (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	294.5	294.5	0	1,492.0	1,492.0	0
5%	235.6 to 265.0	224.4 to 252.2	11.2 to 12.6	1,193.0 to 1,342.8	1,136.0 to 1,278.8	57.0 64.0
10%	176.0 to 235.6	160.0 to 214.2	16.0 to 21.4	895.0 to 1,193.6	814.0 to 1,085.1	81.0 to 108.5

Wild furs are included in the Tariff Schedules of the United States as item 123.00 Skins bearing certain wool or hair, if suitable for use as furs, and item 124.10 Other furskins, raw or not dressed (U.S. International Trade Commission 1983b). Both categories are duty free (U.S. International Trade Commission 1983a). Therefore, no duty was estimated for these items for 1980 or 2000.



However, the levy of a potential 5 to 10% excise tax on imports of wild furs would have yielded revenue ranging from about \$4.2 to \$9.4 million in 1980, increasing to an estimated \$22 to \$57 million in 2000, based on increasing domestic real disposable personal income. Imports of wild furskins were estimated to range from \$84.2 to \$94.0 million in 1980 (U.S. International Trade Commission 1983b). These estimates also assumed that importers would not convert pelts into garments to avoid a potential import duty of 5 to 10% on wild skins. The extent of conversion which would occur, if any, is unknown.

### Economic Efficiency

No estimate of the price elasticity of demand or supply of wild furs was available. However, raw, wild fur can be viewed as an input into the production of fur clothing. The four factors influencing the price elasticity of an input are (Baird 1975): (1) technical feasibility of input substitutions; (2) price elasticity of supply of substitutes; (3) price elasticity of demand for final product; and (4) amount of adjustment time.

Ranch-produced furs are very close substitutes for pelts from some wild furbearing animals, such as mink. The input demand for these species is very price sensitive. The demand for the final product is likely to be price elastic, because furs generally are considered a luxury, they have a large price relative to income, and substitutes are available for at least some wild furs.

The short run price elasticity of demand for species where ranch production is feasible should be around 4 to 5. This means that a 10% increase in price could reduce the quantity of wild furs bought from trappers by as much as 40 to 50%. When fur ranches have had enough time to expand production capacity, this price elasticity could be as high as 6 to 7. In this case, the trapper would bear most of the excess burden of the tax, and it may be quite large.

One way of viewing the case where ranch production is feasible and dominates wild harvest is as follows. Ranch production is the dominant industry, and its supply and consumer demand set the price for all pelts. The trapper is so small relative to the market that he or she must accept the market price. The tax cannot be passed on by the trapper to the buyer, and it reduces the trapper's income, dollar for dollar. The amount of excess burden borne by the trapper depends on whether he or she has alternative income earning opportunities that provide an equivalent monetary and nonmonetary reward.

However, the dominant or sole supply for most species is animals trapped in the wild. The price elasticity of input demand for these species is much less elastic than for ranch production. The primary factor influencing their price elasticity is the price elasticity of the final output, fur clothing. This good is likely to be relatively price elastic, so the derived demand for wild furs would be as well. A price elasticity of 3 to 5 is not unreasonable to expect. In this case, the excess burden would be shared between trappers and consumers, depending on the alternative employment opportunities of trappers. If trappers have good alternative employment opportunities, consumers would bear most of the tax.

Given the proportion of wild fur sales falling into each of the two cases discussed above, the tax would be largely passed to consumers. Therefore, the most likely range of price elasticities would be between 3 and 5. Therefore, a 5% tax could reduce the quantity of wild furs bought from trappers by as much as 25%. A 10% tax would involve an above average percentage of excess burden.

### Benefits Received

A tax on wild furs harvested by trappers might result in some direct benefits to the trappers. Consumers would also pay a proportion of a potential tax, however, there would be no direct benefits to people who wear fur clothing as a group. The trappers likely would absorb most of the tax for species where commercial raising of furs occurred. If the expenditure of tax monies on habitat management resulted in large enough increases in fur bearing animals that the price of wild pelts fell relative to ranch pelts, then trappers and consumers would both benefit. When the sole source of supply is wild furs, trappers could benefit from habitat improvements that increased the amount of habitat or population levels of fur species. The demand is price elastic, and total revenue would increase if the price fell because of an increase in the supply of wild furs. The price decrease also would benefit consumers.

### Ability to Pay

The tax likely would be borne by trappers for mink, fox, and any other species where domestic raising is significant. Available data indicate that trapping income represents 17% of the total income of individuals who trap (Boddicker 1979). However, the percentage of income obtained from trapping falls as income rises; therefore, a tax on wild furs of species that also are raised on fur ranches would appear to be regressive. About 30% of income for trappers in the 0 to \$5,000 income class is from trapping. This falls to 13% in the \$7,000 to \$12,000 range and to 9% in the \$20,000 plus range. The majority of trappers were reported to be in the 26 to 45 age bracket. The next largest group was the teenage bracket. Fewer than 11% of people 56 years or older trapped.

For wild furs where all or most of the pelts are obtained by trapping (such as bobcat, beaver, wolf, wolverine, and river otter), a large percentage of the tax can be passed on to the consumer. No data were found for expenditures by income class on fur clothing made from furs whose only source was wild animals. Many consumers may not be concerned about whether the furs are wild or domestic, so omission of this distinction may not be crucial. The most recent Consumer Expenditure Survey by the Bureau of Labor Statistics (U.S. Department of Labor 1978) provided data for fur coat, stole, and snowsuit expenditures by income and age classes. The average annual expenditures on these products rises as a function of income. The percentage of income paid as taxes on an average annual basis is fairly stable in the lower and middle income ranges. The tax is slightly regressive at first, but becomes progressive between the \$12,000 to \$15,000 and the \$20,000 to \$25,000+ ranges (in 1972 dollars). The Suits Index for the subcategory of fur coats and stoles is slightly regressive or almost proportional overall ( $S = -0.082$ ). Average

annual expenditures on fur coats, stoles, and snowsuits follows a normal distribution with highest dollar expenditures in the 35 to 44 age class. Purchases rapidly drop off for age groups above and below this range.

Determination of the precise balance between the regressive impacts on trappers for species with ranch competition and proportional impacts on consumers for other species requires additional data about the number of individuals (trappers and consumers) affected and the degree to which they are affected.

G. EXCISE TAX OF 5 TO 10% ON BACKPACKING AND CAMPING EQUIPMENT LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

Product/Source Definition

This potential funding source was evaluated by categories of products purchased as camping equipment. The camping equipment data thus reflect items identified by consumers as "camping equipment", even though certain items may be used wholly or in part for other purposes. These products were sold at retail by general sporting goods outlets, sport specialty stores, department and discount stores, catalog showrooms, mail order, and other outlets (National Sporting Goods Association 1983).

The following articles were included in backpacking and camping equipment. The data and definitions reflect those used by the National Sporting Goods Association (Doyle pers. comm).

Backpacks. These products included backpacks with internal and external frames and soft packs. An unknown quantity of day packs may have been excluded from this category by consumer respondents who did not associate these items with camping equipment.

Tents. These products included backpacking and family camping tents, pup-tents, and other camping tents. Tent flies and tarps were included under "other camping equipment".

Lanterns. These items included propane and gas lanterns and some battery powered lanterns (unknown quantity), identified by consumers under camping equipment.

Camp stoves. These items included all stoves identified by consumers as camping equipment.

Sleeping bags. These products included rectangular and contoured sleeping bags, as well as an unknown quantity of slumber bags identified by consumers as camping equipment.

Heaters. These products included catalytic tent heaters and other tent heaters.

Other camping equipment. These items included tent flies, camp cooking gear, tarps, camping mattresses, and other camping equipment, including satchels and carrying cases used in the pursuit of wildlife oriented recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). Due to lack of data, camping equipment not used during observing, photographing, or feeding wildlife were excluded from this category. The quantity and value of this excluded portion of "other camping equipment" was small.

### Funding Potential

No demand estimates or information on price elasticities specifically for camping and backpacking equipment were identified. Therefore, other data were obtained to evaluate the price-quantity relationships of these products.

Units sold and dollar volume data were obtained from National Sporting Goods Association publications (1981, 1982, and 1983) and file data for tents, backpacks, sleeping bags, and lanterns for 1973-82. Less complete data were obtained for camp stoves and heaters. Estimates of sales of "other camping equipment" were based on purchases of these items reported in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982).

A general price elasticity was obtained for sporting goods, wheel goods, and durable toys from Houthakker and Taylor (1970) and Lareau and Darmstadter (1982). This price elasticity was used for all items except backpacks. The short term price elasticity of -0.42 of Lareau and Darmstadter (1982) was used to calculate the initial effects of a tax on sales and tax revenue in 1980. The Houthakker and Taylor (1970) long term price elasticity of -2.389 was used to calculate the effects of a tax on sales and revenue in the year 2000.

Using two stage least squares analysis, attempts were made to estimate demand and supply curves for tents, backpacks, sleeping bags, and lanterns. Except for backpacks, no statistically significant equation (in terms of the F statistic and the t value on price) could be estimated because of the limited range of data. The backpack demand curve is:

$$QBPPC = 0.542 - 0.00098PBP + 0.00121PSB - 0.0002536INC + 0.0000000297(INC)^2$$

$$(-2.496)** \quad (+2.52)** \quad (-2.386)** \quad (+2.377)**$$

$$R^2 = 0.88; \quad F = 7.86***$$

where QBPPC = quantity of backpacks per capita

PBP = real price of backpacks in 1972 dollars

PSB = real price of sleeping bags in 1972 dollars

INC = per capita disposable income in 1972 dollars

\*\* = significant at 95% level

\*\*\* = significant at 99% level

The sales and tax revenue estimates for backpacks are listed in Table B-4.

Table B-4. Estimated potential annual sales of, and tax revenue from, backpacks (millions of units and millions of 1980 dollars).

Potential tax rate	1980			Potential tax revenue
	Quantity	Gross sales	Net sales	
0	1.52	21.08	21.08	0
5%	1.43	20.82	19.82	1.00
10%	1.36	20.74	18.86	1.88

Revenue forecasting equations were estimated using ordinary least squares regression analysis for the two major items (tents and sleeping bags, as well as for all camping goods except backpacks) (Table B-5). There was a downward trend in real dollar sales for tents, sleeping bags, and the other camping equipment items for which revenue equations were estimated. However, this downward trend was offset by the increase in backpack sales. All items were combined in the sales and revenue estimates for 1980 and 2000 (Table B-6), but estimates for the year 2000 must be viewed only as the likely magnitude of revenue because of the short data series available.

Table B-5. Estimated potential annual sales of, and tax revenue from, all other camping goods (sleeping bags, tents, lanterns, camp stoves, heaters) (millions of 1980 dollars).

Potential tax rate	1980		Potential tax revenue
	Gross sales	Net sales	
0	272.3	272.3	0
5%	280.3	267.0	13.3
10%	288.0	262.0	26.2

Table B-6. Estimated potential annual sales of, and tax revenue from, all camping goods (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	293.4	293.4	0	545.2	545.2	0
5%	301.1	286.8	14.3	528.8	503.6	25.2
10%	309.0	280.9	28.1	469.5	426.8	42.7

The year 2000 forecasting equation for all items other than backpacks was:

$$\text{Real camping sales} = -12234 + 66.4\text{POP} - 0.3895\text{DPI} - 137.7\text{TREND} \\ (1.909)^* \quad (-4.815)^{***} \quad (-1.652)^* \\ R^2 = 0.92 \quad F = 15.44^{***}$$

where POP = population in millions

DPI = real disposable per capita income in 1972 dollars

TREND = trend variable with 1975 = 1

\* = statistically significant at the 90% level

\*\*\* = statistically significant at the 99% level

Imports of backpacking and camping equipment were evaluated in terms of the following products: tents; sleeping bags; backpacks; lanterns; camp stoves; and heaters. Each of these products is discussed below.

#### Camping Tents

In 1980, 57% of camping tent unit sales were imported (Dieltz and Waugh 1983). The value of these imports is unknown, but foreign producers concentrate on lower priced tents (Dieltz and Waugh 1984). Thus, it was assumed that the value of imported tents in 1980 was within a range of 25 to 50% of the value of total domestic sales. Tent sales in 1980 were \$181.5 million at

retail or about \$105.1 million in producer/importer values, based on margins estimated for 1972 by the Bureau of Economic Analysis, U.S. Department of Commerce (Horowitz pers. comm.). The value of imported tents was estimated to be within a range of about \$25 to \$50 million in 1980 in producer prices, based on the imported share of tent unit sales.

In 1980, tents were included under the following Tariff Schedules of the United States items (Cook pers. comm.), as shown in Table B-7. Note that item 386.0430 (Table B-7) includes other cotton articles, as well as tents. Item 386.1104 did not exist in 1980 but was included with other articles under item 386.09. Items 386.5042 and 389.6210 both include the value of an unknown quantity of tarpaulins, as well as tents. The rates of duty shown for these items apply to imports from developed countries not under Communist control. However, no duty presently (1984) is collected on backpacking tents imported from South Korea, and 6.3% is charged on these tents imported from Taiwan. The President of Outdoor Venture Corporation, a leading supplier of tents, estimated that up to 90% of all backpacking tents currently sold in the United States are manufactured either in South Korea or Taiwan (Egnew 1984). However, estimates of origins, duty rates, and value of imports were not available for other countries and other types of tents. Thus, the lack of data precluded estimation of tariff revenues from tents in 1980 and 2000. Recent revisions to the Tariff Schedules of the United States will provide more data on imports of tents but these data are not yet available. Data or estimates on the value of tents imported duty free and the value of tents included under items and rates in Table B-7 are needed to provide a basis for estimating duty collected on these imports.

### Sleeping Bags

Imported sleeping bags are classified under Tariff Schedules of the United States item 386.1115 Ornamented man-made fiber sleeping bags, 389.6245 Man-made fiber sleeping bags, not ornamented, and item 748.5520 Other sleeping bags (U.S. International Trade Commission 1983a). The latter item includes down sleeping bags (Dieltz pers. comm.).

Data were not available for 1980 on sleeping bag imports (Cook pers. comm.). However, data were available for 1983, based on changes in the tariff schedules which resulted in the compilation of data specifically on sleeping bag imports. These data showed that sleeping bags valued at \$3.4 million yielded tariff revenue of \$173,401, based on an overall duty rate of 5.1% (Cook pers. comm.; Cunningham pers. comm.). Comparable data were not available for years before 1983, so the 5.1% overall duty rate was adjusted to reflect a 25% rate in 1980 for item 386.1115, instead of the 20% rate in 1983. The adjusted duty rate of 5.7% was used to estimate tariff revenue in 1980.

In 1980, consumers purchased sleeping bags valued at \$201.3 million in retail prices (National Sporting Goods Association 1982). The \$201.3 million in retail prices is equivalent to about \$116.6 million in producer values, based on margins estimated for 1972 by the Bureau of Economic Analysis, U.S. Department of Commerce (Horowitz pers. comm.). Multiplying the \$116.6 million in 1980 sales by the 2.7% of total sales represented by imports in 1983 yielded

Table B-7. Tent import duty rates.

Item	Description	Rates of duty	
		1980	1987
386.0430	Ornamented articles of cotton, other	40%	22%
386.1104	Ornamented tents of man-made fibers	25% <sup>a</sup>	10%
386.5042	Cotton not ornamented tents and tarpaulins	14%	7%
389.6210	Man-made tents and tarpaulins not ornamented	25¢ lb + 15% ad valorem	9%

<sup>a</sup>Item 386.1104 did not exist in 1980 but was included with other products in item 386.09. The rate of duty for item 386.09 was 25% (Cook pers. comm.).

an estimated value of imported sleeping bags of \$3.1 million in 1980. Multiplying the \$3.1 million estimated imports by the adjusted 5.7% effective duty rate, overall, yielded estimated tariff revenue of \$176,000 in 1980, assuming the same proportions of kinds of sleeping bags were imported in 1980 as in 1983. Potential taxes of 5 to 10% would add about \$151,000 to \$297,000 to this duty, assuming reductions in import sales would be proportional to domestic production losses. These potential duties are included in the potential revenue estimates, Table B-5.

The duty from imports of sleeping bags was estimated to decrease through the year 2000, based on decreasing real sales, estimated above, and scheduled reductions in the duty rate to 1987. The 1987 rates were assumed to continue unchanged to the year 2000.

#### Backpacks

On January 1, 1984, a separate item was established for backpacks under the Tariff Schedules of the United States. Data for this item, 706.4144, were available only for the period from January through May, 1984. Thus, only limited data were available on imports of backpacks (Seastrum pers. comm.). Previously, backpacks were imported under classifications with other goods made of similar materials.



Total imports of backpacks from January through May, 1984, were valued at \$9.7 million, with a duty rate of 20% yielding \$1.9 million in tariff revenue. The revenue collected is expected to increase as importers become cognizant of the new item 706.4144 and reassign backpacks from other classes to this item. Data were not yet available that may reveal a seasonal pattern in the January through May data. A seasonal pattern could show higher or lower imports during various periods of the year.

The average monthly value of imports of backpacks during the first 5 months of 1984 were multiplied by 12 to estimate imports of \$23.3 million during 1984, with revenues of about \$4.6 million. Retail sales of backpacks were \$94.5 million in 1982 (National Sporting Goods Association 1983). Backpack unit sales increases of 8% in 1983 and 7.8% in 1984 were estimated by industry specialists (Dieltz and Waugh 1984). Retail sales of \$109.2 million in 1984 were estimated by assuming that dollar values increased in 1983 and 1984 at rates comparable to unit sales. The retail sales of \$109.2 million estimated for 1984 are equivalent to about \$63.2 million in producer prices, based on margin data estimated for 1972 by the Bureau of Economic Analysis, U.S. Department of Commerce (Horowitz pers. comm.). Dividing the estimated imports of backpacks valued at about \$23.3 million in 1984 by the estimated total sales of \$63.2 million, in producer prices, indicated that about 36.8% of backpacks sold in 1984 may be imported.

Other data were used to develop another estimate of backpack sales, for comparison with the \$23.3 million estimate. About 20% of backpack retail sales are imported, according to an industry source, as relayed by the publisher of a sports industry publication (Bischoff pers. comm.). Multiplying the estimated retail sales of \$109.2 by 20% yielded imports estimated at about \$21.8 million, which compares with the \$23.3 million in import sales estimated above.

In 1980, retail sales of backpacks were \$59.9 million (National Sporting Goods Association 1983), which is equivalent to about \$34.7 million in producer prices, based on margin data estimated for 1972 by the Bureau of Economic Analysis, U.S. Department of Commerce (Horowitz pers. comm.). Imports of backpacks are estimated at about \$12.8 million in 1980, assuming that 36.8% of the backpacks sold, in producer prices, were imported, as estimated above for 1984. The duty collected on the \$12.8 million imports was estimated at about \$2.6 million, based on the 20% rate of duty in 1984. This rate has not changed since 1980, and there is no change scheduled in future years (Seastrum pers. comm.). However, actual revenues collected in 1980 may differ from the \$2.6 million duty estimated, depending on the dutiable value of backpacks, origins, and rates applicable under the various 1980 classifications. These data, however, were not available.

Potential taxes of 5 to 10% would add about \$0.6 to \$1.2 million to the existing duty, assuming reduction in import sales would be proportional to domestic production losses. These potential duties are included in the potential revenue estimates, Table B-4.

The duty collected on imported backpacks would increase through the year 2000, based on increasing backpack sales and assuming no change occurs in the current duty rate of 20%.

### Lanterns

Camping lanterns are classified under Tariff Schedules of the United States item 653.3000 which includes incandescent lamps designed to be operated by propane or other gas, or by compressed air and kerosene or gasoline. The rate of duty for item 653.3000 articles imported from developed countries, other than Communist or Communist-controlled countries, was 4.8% in 1980, decreasing to 3.7% in 1987 (Rapkins pers. comm.). Imports of these items from less developed countries are duty free under the Generalized System of Preferences.

In 1980, the value of item 653.3000 articles on which duty was collected was about \$2.0 million with tariff revenue of \$98,160 (Rapkins pers. comm.). Virtually all of this revenue was from camping lanterns, based on comparison with industry estimates (Bischoff pers. comm.; National Sporting Goods Association 1982). Potential taxes of 5 to 10% would add about \$100,000 to \$196,000 to the existing duty, assuming reductions in import sales would be proportional to domestic production losses. These potential duties are included in the potential revenue estimates, Table B-5. The duty from imported lanterns would decrease by the year 2000, based on real dollar sales of these products and future scheduled decreases in the rate of duty.

### Camp Stoves and Heaters

Camp stoves and heaters are classified under Tariff Schedules of the United States item 653.4500, which includes portable stoves, heaters, cookers, and grates designed to be operated by propane or other gas, or by compressed air and kerosene or gasoline. The rate of duty for item 653.4500 articles imported from developed countries, other than Communist or Communist-controlled countries, was 9% in 1980, decreasing to 5.7% in 1987 (Rapkins pers. comm.). Imports of these items from less developed countries are duty free under the Generalized System of Preferences.

In 1980, the value of item 653.4500 articles on which duty was collected was \$4.2 million, yielding tariff revenue of \$377,820 (Rapkins pers. comm.). Virtually all of this revenue was from camp stoves and heaters, based on industry estimates (Bischoff pers. comm.; National Sporting Goods Association 1982). Potential taxes of 5 to 10% would add about \$206,000 to \$404,000 to the existing duty, assuming reductions in import sales would be proportional to domestic production losses. These potential duties are included in the potential revenue estimates, Table B-5. The duty from imports of camp stoves and heaters would decrease through the year 2000, based on real dollar sales of these products and future scheduled decreases in the rate of duty.

Duties collected in 1980 on imports of backpacking and camping equipment were estimated at about \$3.3 million, excluding camping tents. Potential taxes of 5 to 10% would add about \$1.1 to \$2.1 million to this import duty,

assuming an excess burden proportional to the loss in domestic output. The added potential duty was included in the potential revenue estimated for this source.

### Economic Efficiency

The demand for backpacks in 1980 had a price elasticity of 1.778. The percentage of excess burden associated with a 5 and 10% tax, assuming it was fully passed on to consumers, would be 3.2 and 5.9%, respectively. Thus, a 5% tax would have an average excess burden, and a 10% tax would have a slightly above average excess burden. Given the strong income effect, substantial increases in future demand for backpacks are expected. The future demand should become very price inelastic.

The estimated price elasticity of demand for backpacks is similar to Houthakker and Taylor's (1970) estimate of the long term price elasticity for sporting goods as a whole of 2.3889. Therefore, the percentage of excess burden for camping equipment in general could be as high as 6% at the 5% tax level. Although a potential 5% tax would not cause a serious distortion in economic efficiency, a 10% tax could because the long term percentage of excess burden might be as high as 13 to 15%.

The economic distortion is partially mitigated by the fact that a tax on goods used for leisure activities provides an indirect, partial tax on leisure. This helps reduce the excess burden associated with the income tax, regarded by most economists as a tax on work (with leisure being tax free).

The estimated short term elasticities in Houthakker and Taylor (1970), and more recent estimates in Lareau and Darmstadter (1982), indicate a degree of price inelasticity or price insensitivity. The short term price elasticities range from -0.42 to -0.88 in the two studies, respectively. These estimates suggest very little short term excess burden.

### Benefits Received

Sixty eight percent of the campers and hikers who said wildlife was a secondary purpose of their trips indicated that the presence of wildlife was an important reason for selecting the areas they visited in 1980 (U.S. Department of the Interior and U.S. Department of Commerce 1982). In addition, nearly 40% of the hiking and backpacking trips not taken primarily to view wildlife were enhanced by seeing or hearing wildlife. Kellert (1978) reported that backpackers and campers were appreciatively oriented toward wildlife and natural habitats. Therefore, an excise tax on backpacking and camping gear would be related to benefits received, although the linkage is certainly less than 100%. The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) indicated that 18% of the people who had purchased or owned backpacking equipment in 1980 used it primarily for nonconsumptive wildlife recreation (Shaw and Mangun 1984). About 13% of the people who purchased or owned tents and other camping equipment in 1980 used this equipment primarily for nonconsumptive wildlife recreation.

The benefits received linkage is strengthened because a more than proportional amount of the tax would be paid by persons buying "top of the line" equipment, which is more likely to be used exclusively for backpacking and camping. Slumber bags and pup tents may make up the majority of units sold, but their low price means that a disproportionately low amount of tax is paid per individual on these purchases. The benefits received linkage could be increased if the tax was omitted on lower priced items that might not be used in camping or backpacking activities.

#### Ability to Pay

The average retail expenditure by a household purchasing camping equipment in 1980 was \$212 (Shaw 1983). With a 10% tax at the manufacturer/importer level, a typical household would have paid \$10 to \$15 in excise taxes. In the low income group (less than \$15,000 in 1980 dollars), most of the large expenditures for camping equipment are made by younger persons (18 to 24 and 25 to 34 age brackets). In the middle income range (\$15,000 to \$29,999 in 1980 dollars), above average expenditures are concentrated in the 45 to 54 age group. The 25 to 30 and 55 to 64 age groups have the largest expenditures in the \$30,000 and above income group.

Expenditures by income class are bimodal, with the largest expenditures by the lowest two income brackets (\$0 to \$5,000 and \$5,000 to \$10,000) and the higher income bracket (\$40,000 to \$50,000). The tax would be regressive because expenditures actually fall as income rises at low income levels and growth in expenditures does not keep pace with income at the higher income levels. The Suits Index is -0.148, indicating a mildly regressive overall pattern.

#### H. EXCISE TAX OF 2 TO 5% ON OFF-ROAD VEHICLES LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

##### Product/Source Definition

The following items are included as off-road vehicles:

Snowmobiles. This potential funding source includes both domestically produced and imported snowmobiles sold in the United States.

Off-road motorcycles. Off-road motorcycles are vehicles not certified as complying with Federal Motor Vehicle Safety standards for operation on public roads (Motorcycle Industry Council 1982). These units include trail bikes and three- and four-wheel all-terrain vehicles produced or imported by major manufacturers (Honda, Yamaha, Kawasaki, Suzuki, and Harley Davidson) (Motorcycle Industry Council 1982; Amette pers. comm.) and other producers. Three- and four-wheel all-terrain vehicles produced by other domestic manufacturers are included in "other all-terrain vehicles".

Motorcycles designed and certified for use on highways were excluded from this potential source, as were dual purpose motorcycles which are designed for use on public roads as well as off-highway recreational use (Motorcycle Industry Council 1982).

Other all-terrain vehicles. This potential funding source consists of all-terrain vehicles other than off-road motorcycles, including gas or electrically propelled vehicles for the transport of people or goods. All-terrain vehicles used in oil field, logging, or other commercial operations are included, along with those used for recreational or other purposes.

Four-wheel drive vehicles. This potential funding source includes four-wheel drive vehicles manufactured domestically or imported that have a gross vehicle weight of 10,000 pounds or less. Light-duty trucks (pickups) and sport-utility vehicles are included, as well as station wagons and similar vehicles with four-wheel drive.

### Funding Potential

Demand equations or price elasticities for these products were not available. Therefore, other data were obtained or estimated that could be used to analyze the price-quantity relationship of these products.

Snowmobiles. Two sets of quantity data and one set of unit prices for snowmobiles were obtained. Both sets of data were used to determine the price-quantity relationship for snowmobiles. Snowmobile shipments (including imports) for 1971-83 were provided by International Snowmobile Industry Association staff (Ahern pers. comm.). These data included both the estimated average unit retail price and the number of units sold in the United States.

Estimates of U.S. snowmobile purchases for 1964-82 were obtained from an International Trade Commission publication (U.S. International Trade Commission 1983c). The estimated U.S. purchases of snowmobiles in 1983 were provided by International Trade Commission staff (McElroy pers. comm.).

An acceptable demand equation with price and income could not be estimated for snowmobiles because the data showed almost no variation in relative (deflated) price. Real sales decreased 71% from 1972 to 1982. Several revenue estimating equations utilizing income, income squared, and a trend variable as the independent variables all predicted negligible sales by the year 2000 (Table B-8). The most statistically robust equation was:

$$\text{Real snowmobile sales} = 422200000 - 10282.73\text{TOTINC} \\ (-4.52)^{***}$$

$$+ .0067(\text{TOTINC})^2 - 7311000\text{TREND} \\ (5.37)^{***} \quad (-3.46)^{***}$$

$$R^2 = 0.887 \quad F = 18.44^{***}$$

where Real snowmobile sales are in 1972 dollars

TOTINC = National disposable real income in 1972 dollars

TREND = trend variable where 1972 = 1

\*\*\* = significant at 99% level

Table B-8. Estimated potential annual sales of, and tax revenue from, snowmobiles (thousands of units and millions of 1980 dollars).

Potential tax rate	1980				2000			
	Quantity	Gross sales	Net sales	Potential tax revenue	Quantity	Gross sales	Net sales	Potential tax revenue
0	129.0	181.4	181.4	0	-----negligible-----			
2%	123.0	176.0	172.5	3.5	-----negligible-----			
5%	113.0	167.8	159.8	8.0	-----negligible-----			

Off-road motorcycles. Off-road motorcycle shipments from major producers, including imports, for 1973-82 were estimated from data provided by Motorcycle Industry Council staff (Murphy pers. comm.). Data on the wholesale value of off-road motorcycle shipments for 1976-82 also were provided from the Motorcycle Industry Council (Murphy pers. comm.). Values for the years 1973-75 were estimated by correlation with imported automobile prices (about 90% of off-road motorcycles may be imported). Estimates for both units shipped and the wholesale value of these shipments were developed for 1973-82. These data were used to evaluate product demand if the potential tax rates were levied. A least squares regression analysis was used to estimate the demand curve. With such a large percentage of domestic consumption attributable to imports, the quantity consumed may influence, but does not determine, price. A double natural log demand curve was utilized; therefore, the coefficients on price and income can be interpreted as price and income elasticities, respectively. The equation is:

$$\ln Q_{\text{mtrcy}} = -22.76998 - 1.30881 \ln P_{\text{mtrcy}} + 3.146483 \ln \text{TOTINC}$$

(t values) (-1.012) (4.904)\*\*\*

$R^2 = 0.839$   $F = 18.32^{***}$

where  $\ln Q_{\text{mtrcy}}$  = natural log of quantity of off-road motorcycles  
 $\ln P_{\text{mtrcy}}$  = natural log of real price of motorcycles in 1972 dollars  
 $\ln \text{TOTINC}$  = natural log of real total disposable income in 1972 dollars

\*\*\* = statistically significant at 99% level

The overall equation is quite significant, as indicated by the F value. The t value on price is smaller than desirable, but should yield a rough approximation of the change in quantity sold resulting from a tax. The equation predicts the 1980 level of consumption fairly accurately.

Data were available only on off-road motorcycles produced by major manufacturers. Sales of these units produced by other manufacturers, such as European producers, would increase the potential sales and excise tax revenue estimates, Table B-9.

Table B-9. Estimated potential annual sales of, and tax revenue from, off-road motorcycles (thousands of units and millions of 1980 dollars).

Potential tax rate	1980				2000			
	Quantity	Gross sales	Net sales	Potential tax revenue	Quantity	Gross sales	Net sales	Potential tax revenue
0	370.0	311.3	311.3	0	3,265.0	2,746.5	2,746.6	0
2%	361.0	309.7	303.8	5.9	3,182.0	2,729.8	2,676.2	53.6
5%	348.0	307.0	292.4	14.6	3,063.0	2,705.6	2,576.8	128.8

Other all-terrain vehicles. Demand or price elasticity data for all-terrain vehicles were not available. In addition, the Specialty Vehicle Institute of America was unable to provide these data (Van Kleeck pers. comm.). Therefore, only limited information was available for this potential funding source.

All-terrain vehicle shipments of \$23.6 million were reported by domestic manufacturers in the 1977 Census of Manufactures (Valdez pers. comm.). In 1972, all-terrain vehicles sales were reported at \$12.7 million, including parts (Valdez pers. comm.). Subtracting the estimated \$4.1 million in parts

sales leaves vehicle sales of \$8.6 million in 1972. All-terrain vehicle shipments increased from the estimated \$8.6 million in 1972 to a reported \$23.6 million in 1977, in nominal dollars. In constant 1972 dollars, shipments increased from \$8.6 to \$16.6 million in 1977, based on increases in producer prices for transportation equipment during this period (U.S. Department of Commerce 1982). The average annual increase was \$1.6 million or 9.6% of 1977 shipments. Assuming continuation of this annual rate of growth, estimated shipments in 1980 were about \$21.9 million in 1972 prices or \$39.8 million in 1980 prices (Table B-10).

Sales of all-terrain vehicles were assumed to increase at the same rate as the population. This assumption may be conservative inasmuch as the available data for years 1972 and 1977 showed nearly a doubling of sales.

The effect of a 2 and 5% tax on sales was calculated assuming a price elasticity of demand equal to 5 (see Economic Efficiency section). In addition, it was assumed that the entire tax would be passed on to the consumer (Pechman and Okner 1974).

Table B-10. Estimated potential annual sales of, and tax revenue from, all-terrain vehicles (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	39.8	39.8	0	46.8	46.8	0
2%	36.6	35.8	0.8	43.1	42.2	0.8
5%	31.8	30.3	1.5	37.5	35.7	1.8

Four-wheel drive vehicles. Demand curves and price-elasticity data were not available for four-wheel drive vehicles. Therefore, other data were obtained in order to estimate demand curves. The principal source of data used to determine the number of four-wheel drive units sold by domestic manufacturers was Ward's Automotive Yearbook, published annually by Ward's Communications, Inc., Detroit, Michigan. Data from this source were used to estimate the number of units sold for model years 1974 through 1982.

Price data were compiled from the annual Car Prices, published by People's Publishing, Inc., Compton, California, for domestic production of four-wheel drive vehicles beginning in 1974. Two values were estimated: (1) the dealer price of the lowest cost model; and (2) the mean value of the dealer price for



all models listed. The latter value was calculated from the mean values for 6-cylinder and 8-cylinder models, when shown, and weighted by the number of 6-cylinder and 8-cylinder units produced, which was estimated from data in the Ward's Automotive Yearbook.

Data on imports of four-wheel drive vehicles were obtained from three sources. The number of units imported was compiled from Ward's Automotive Yearbooks and file data from the National Highway Traffic Safety Administration (Kee pers. comm.). Import prices were estimated from data in Foreign car prices (Edmund Publications Corporation 1980a) and Vans•pickups off-road buyers guide (Edmund Publications Corporation 1980b). The value and quantity of imported four-wheel drive vehicles were estimated only for 1980. The limited historical data precluded estimating demand equations for four-wheel drive imports.

The longest time series data available were for nine selected domestic models for the years 1974 to 1982. However, attempts to estimate individual model demand curves proved difficult. The primary difficulty was the price of substitute models. Because only 9 years of data were available, analyzing the price, income, real interest rate, and prices of even four substitute vehicles would have used up almost all of the degrees of freedom. Therefore, the nine main four-wheel drive vehicles (Ford Bronco, Ford F150, Chevy Blazer, GMC Jimmy, Chevy K10, Dodge Ramcharger, Jeep CJ5, Jeep Cherokee, and Jeep Wagoneer) were divided into two groups. The Ford, Chevy, and Dodge 4x4 models were grouped together, as were the three different Jeep models.

Two stage least squares analyses were used to estimate the demand and supply curves for the six Ford, Chevy, and Dodge models:

$$Q_D = -5032431 - 1149.7P + 6.98TOTINC - 58090RIRT + 702.68P_{Jeeps}$$

$$\begin{array}{ccccccc} & (-2.66)** & (3.96)*** & (-5.107)*** & (1.666)* & & \\ & & F = 7.36*** & & R^2 = 0.88 & & \\ & & DW = 2.45 & & & & \end{array}$$

$$Q_S = -1813060 + 1157.6P - 7063.4LCOST - 1721.137PPI$$

$$\begin{array}{ccc} & (+2.429)** & (-0.47) & (-0.137) \\ & F = 1.454 & R^2 = 0.1457 & DW = 1.779 \end{array}$$

where  $Q_D, Q_S$  = quantity of four-wheel drive vehicles

$P$  = relative price in 1972 dollars

$TOTINC$  = total real disposable personal income in 1972 dollars

$RIRT$  = real interest rate (nominal interest rate minus inflation rate)

$P_{Jeeps}$  = real price of Jeeps in 1972 dollars (substitutes)

LCOST = labor cost index

PPI = producer price index

\* = significant at 80% level

\*\* = significant at 95% level

\*\*\* = significant at 99% level

The demand equation is quite significant overall; the crucial price and income variables are also significant. The size of the income coefficient is quite large, implying that sales are quite sensitive to income. All variables have the theoretically correct signs. The supply equation has a statistically significant price coefficient and theoretically correct signs on labor cost (LCOST) and materials cost (PPI). The insignificance of these latter two variables is a statistical artifact resulting from a very high degree of multicollinearity between the two variables. Removing PPI from the equation resulted in LCOST being statistically significant at the 95% level and almost no change in the price coefficient (1162.8 versus 1157.6). Because the insignificance was due to multicollinearity, both variables were included, rather than risk bias to the other variables by omitting PPI (Kelejian and Oates 1974). These demand and supply curves have a high degree of price elasticity. Therefore, high tax rates would have a substantial dampening affect on sales.

The Jeep demand and supply curves also were estimated using two stage least squares analyses. Unfortunately, no acceptable supply curve could be estimated. The demand curve for the three Jeep models is:

$$\ln(Q_{\text{Jeep}}) = -11.5 - 10.5 \ln(P_{\text{Jeep}}) + 8.69 \ln(\text{TOTINC}) - 2.2 \ln(P_{\text{GAS}})$$

(-.167) (-1.528)\* (1.807)\* (-2.38)\*\*

F = 2.765      R<sup>2</sup> = 0.62

where  $P_{\text{Jeep}}$  = relative price of Jeeps

$P_{\text{GAS}}$  = gasoline price index

Although this demand equation is not highly significant, it provides a systematic way to evaluate the effect of a tax on sales and to project revenues to the year 2000. Jeeps also exhibit a high price elasticity.

Together, the two demand curves represent nearly 50% of all sales of four-wheel drive vehicles and about 61% of all domestically produced four-wheel

drive vehicles. Because demand curves were not estimated for the remaining 50% of vehicles due to inadequate time series data, the results for these nine models were used to estimate the other 50% of sales. The degree of error introduced by this generalization is not known. The resulting potential tax revenue and sales estimates are given in Tables B-11 and B-12. As can be seen from these tables, the future growth in revenues is principally due to increased demand for four-wheel drive vehicles. The large increase in sales of four-wheel drives in the year 2000 is an artifact of three factors. First, the combined effect of government forecasts of doubling real disposable personal income with a demand that is very income sensitive. Second, the short 9 year data track does not allow much confidence in forecasting 20 years into the future. Finally, the time period covered by the data was one of substantial increase in demand for four-wheel drive vehicles. The year 2000 projections assume these trends continue.

Table B-11. Estimated potential annual sales of, and tax revenue from, four-wheel drive vehicles (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	3,684.7	3,684.7	0	119,397.0	119,397.0	0
2%	3,381.1	3,314.5	66.6	116,315.0	114,035.0	2,280.0
5%	2,587.2	2,464.0	123.2	111,921.0	106,592.0	5,329.0

Table B-12. Estimated potential annual sales of, and tax revenue from, all off-road vehicles (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	4,217.0	4,217.0	0	122,190.0	122,190.0	0
2%	3,902.0	3,826.0	76.8	119,111.0	116,753.0	2,334.0
5%	3,093.3	2,946.0	147.3	114,663.0	109,203.0	5,460.0

Imports of off-road vehicles are discussed below.

#### Snowmobiles

Snowmobiles are classified under item 692.10 of the Tariff Schedules of the United States. The duty rate for these vehicles in 1980 was 2.9%, except for imports from Canada which were, and continue to be, duty-free under the Automotive Products Trade Act of 1965. The duty rate of 2.9% will decrease to 2.5% in 1987 as a result of the Tokyo round of Multilateral Trade Negotiations (McElroy pers. comm.).

In 1980, snowmobile imports for consumption were \$23.6 million from all countries except Canada (U.S. International Trade Commission 1983c). Multiplying the imports of \$23.6 million by the 2.9% duty rate yielded an estimated tariff revenue of \$684,400 in 1980. Potential taxes of 2 to 5% would add about \$0.4 to \$1.0 million to this import duty, assuming reductions proportional to the losses in domestic output. These revenues would decrease through the year 2000 based on decreasing real sales and scheduled future reductions in duty rates on these products.

#### Off-road Motorcycles

Off-road motorcycles are classified under Tariff Schedules of the United States item 692.50. The rate of duty on item 692.50 products was 4.8% in 1980, decreasing to 3.7% in 1987 as a result of the Tokyo round of Multilateral Trade Negotiations (McElroy pers. comm.). Data on the number and value of imported off-road motorcycles were not available (Golde pers. comm.). However, a range of imports of these units can be estimated.

The production facilities of Harley-Davidson and Honda in the United States only produce heavyweight motorcycles. The Kawasaki plant in Lincoln, Nebraska, however, produces both mediumweight and heavyweight motorcycles (U.S. International Trade Commission 1983d). Data from the Motorcycle Industry Council show that off-road motorcycles do not include any units with engines larger than 749 cubic centimeters except for a few highly specialized racers sold to qualified riders. These latter machines are so few that they are not entered in data compiled by the Motorcycle Industry Council (Golde pers. comm.; Motorcycle Industry Council 1982).

In 1980, only 2.3% of all off-road vehicles in use in the United States had engines in the 450 to 749 cubic centimeter class, and 4.6% of the off-road motorcycles were in the 350 to 449 cubic centimeter class (Motorcycle Industry Council 1982). Less than 10% of the off-road motorcycles had engines that were 350 cubic centimeters or larger. Thus, less than 10% of the off-highway motorcycles manufactured in 1980 would have 350 cubic centimeter or larger engines if the off-road motorcycles produced in 1980 reflected the engine size distribution of the off-road motorcycles in use in 1980. If all of the units with 350 cubic centimeter or larger engines were manufactured at the only plant in the United States producing mediumweight motorcycles, then about 90% of the off-road motorcycles probably were imported in 1980. Actual domestic

production of off-highway motorcycles in 1980 was estimated to range from zero or few units to not more than 10% of total off-road motorcycle sales in the United States that year.

Further, 10.4% of total 1980 sales of all motorcycles, including on-highway, off-highway, and dual purpose units, were produced in facilities located in the United States (Motorcycle Industry Council 1982). If off-road motorcycles were produced domestically in the same proportion as all motorcycles combined, then about 90% of the off-highway motorcycles would be imported.

Based on the 10.4% estimate of domestic production of all motorcycles in 1980 and the possible range of domestic production of off-road motorcycles of 0 to 10%, it was assumed that about 90% of off-road motorcycles were imported in 1980 and 10% were produced domestically. Potential tariff revenues would be increased by the amount, if any, that actual off-highway motorcycle imports in 1980 exceeded 90% of total sales of these vehicles. As indicated above, up to 100% of off-highway motorcycles may actually be imported.

In 1980, wholesale sales of off-road motorcycles were \$279.5 million (Murphy pers. comm.). Multiplying the \$279.5 million in sales by the estimated 90% imported yielded \$251.6 million in sales of imported off-road motorcycles. Multiplying the estimated \$251.6 million in sales of imported off-road motorcycles by the 4.8% duty rate in 1980 yielded estimated tariff revenue of about \$12.1 million. Actual collection of duty in 1980 was less than \$12.1 million because the duty rate was levied on the dutiable value, which was less than the wholesale value. In addition, the \$12.1 million estimate of duty included an unknown number of three- and four-wheel all-terrain vehicles imported in 1980. The duty rate in 1980 on these all-terrain vehicles was 2.9% instead of the 4.8% duty applicable to off-road motorcycles. The \$12.1 million in estimated revenue thus is overstated by nearly 2% of the duty estimated for each three and four-wheel all-terrain vehicles imported in 1980. However, the estimated duty in 1980 from off-road motorcycles would be increased by duty collected on off-road motorcycles, if any, that were produced by foreign producers other than Japanese manufacturers and imported into the United States. Data on these imports were not available.

The revenues from potential 2 to 5% excise taxes levied to fund State wildlife programs would add about \$4.9 to \$11.8 million to the estimated import duty of about \$12.1 million collected under existing duty rates. The estimated import duty from off-road motorcycles is expected to increase through the year 2000, based on the estimated increase in gross sales. This increase in import duty would occur despite reductions in the duty rates scheduled by the year 1987. This projection of increasing import duty assumed that the rate scheduled for 1987 would be unchanged in the year 2000.

#### Other All-terrain Vehicles

Imports of all-terrain vehicles generally are classified as Tariff Schedules of the United States item 692.10 Other vehicles. The duty rate for these products was 2.9% in 1980, decreasing to 2.5% in 1987 (McElroy pers. comm.).

Quantity, origin, and value data on all-terrain vehicle imports are not tabulated by Customs (McElroy pers. comm.). Thus, data were not available to estimate import duty on these products in 1980 or 2000. However, as noted above, three- and four-wheel all-terrain vehicles imported into the United States from Japan are included with off-road motorcycles.

#### Four-wheel Drive Vehicles

Four-wheel drive imports may be classified as Tariff Schedules of the United States item 692.10 Automobiles or as item 692.02 Automobile trucks. The duty rate for item 692.10 in 1980 was 2.9%, decreasing to 2.5% in 1987. The duty rate for item 692.02 in 1980 was 25%. This 25% rate was established as a temporary rate modification pursuant to Section 252 of the Trade Expansion Act of 1962. The 25% rate continues as the current (1984) rate of duty, with no scheduled reduction in the future (McElroy pers. comm.).

Prior to August, 1980, virtually all four-wheel drive trucks imported from Japan were imported as chassis cabs and cargo boxes with a 4% duty rate. However, in August, 1980, United States Customs ruling reclassified lightweight chassis cab trucks as unfinished trucks, subject to the 25% duty rate for item 692.02. The data used to estimate potential revenues for funding State wildlife programs included imports of four-wheel drive trucks whether or not they were imported as cab chassis or completed vehicles. The number of these vehicles imported as cab chassis is unknown (Kee pers. comm.). The 25% import duty rate was assumed for all four-wheel drive trucks imported from Japan in 1980 because this rate has been in effect since the August, 1980, ruling by Customs on unfinished trucks and has been effective for finished trucks since implementation under the Trade Expansion Act of 1962.

In 1980, estimated four-wheel drive car imports were about \$247.6 million, valued at dealer costs published in Foreign car prices (Edmund Publications Corporation 1980a) and Vans•pickups offroad buyers guide (Edmund Publications Corporation 1980b) and based on units imported as published in Ward's Automotive Yearbooks and file data from the National Highway Safety Administration (Kee pers. comm.). Data from these sources also were used to evaluate four-wheel drive trucks imported in 1980. The value of these trucks was estimated at about \$593.7 million at dealer costs. Multiplying the \$247.6 million in automobile imports by the 2.9% duty rate yielded a tariff revenue estimate of about \$7.2 million on imported four-wheel drive automobiles. Multiplying the \$593.7 million dealer cost value of imported four-wheel drive trucks imported from Japan in 1980 by the 25% rate of duty yields duty estimated at \$148.4 million. The actual duty collected may have been substantially lower than \$148.4 million, depending on the number of these vehicles, if any, which may have been imported as cab chassis with a 4% duty rate and the dutiable value, as described below. As stated above, data showing the number of these trucks that were imported with a 4% duty rate were not available and the actual dutiable value is unknown.

The estimated potential import duty on four-wheel drive vehicles was based on dealer costs. These costs were higher than the dutiable value used

by Customs to calculate duty. For example, dealer costs may include transportation, insurance, and duty paid, which were not included in the dutiable value. Dutiable values of four-wheel drive imports were not available (McElroy pers. comm.).

Potential excise taxes of 2 to 5% levied to fund State wildlife programs would add \$15.2 to \$28.2 million to the import duty of about \$155.6 million, estimated under the existing 25 and 2.9% duty rates for 1980 imports. The estimated revenues from imports would increase through the year 2000, based on the estimated increasing gross sales and continuation of the 25% duty rate for four-wheel drive trucks and the 2.5% duty rate reached in 1987 for cars.

The total estimated duty collected in 1980 from off-road vehicles, other than certain all-terrain vehicles, would have been about \$168.4 million under the existing rates. Potential taxes of 2 to 5% would have yielded additional revenue of about \$20.5 to \$41.0 million, assuming imports would bear excess burden proportional to domestic production. This potential duty of \$20.5 to \$41.0 million was included in the potential estimated revenues.

### Economic Efficiency

Snowmobiles. Two factors that tend to make the demand for snowmobiles price sensitive are their large price relative to income and the fact that the good often is considered a luxury, rather than a necessity. One factor that tends to reduce their price sensitivity is that few close substitutes for snowmobiles for mechanized backcountry winter travel or mechanized snow-based winter recreation exist. In balancing these two opposing effects, data show that real disposable income rose by 10% while real sales fell by 71%. Relative price appears to have been fairly constant. This relationship may indicate that the income effect could partly offset the substitution effect of the tax. Depending on the sign and size of the income effect compared to the substitution effect and the fact that the good is often considered a luxury rather than a necessity, the likely range of price elasticity is from 1.5 to 2.5. A price elasticity of 2.5 implies that a 1% increase in price would result in a 2.5% decrease in the quantity sold. An elasticity of 2.5 was used as an upper bound estimate for revenue loss and excess burden calculations.

The upper bound estimate of the excess burden of a potential 2% tax is \$91,000. A 5% tax could result in a fairly large excess burden of \$564,500. The percentage of excess burden would likely not exceed 2.5 for a 2% tax. The percentage of excess burden for a 5% tax would be, at most, 7.0%. A 5% tax would result in a slightly above average economic distortion.

Off-road motorcycles. The demand for off-road motorcycles has an almost unitary price elasticity of 1.3. The percentage decrease in quantity is almost equal to the percentage tax rate. The potential annual excess burden would be \$75,833 at the 2% tax level. This represents only a 1.3% excess burden or \$0.013 of economic efficiency loss for each dollar of revenue gained, a relatively minor distortion. A 5% excise tax would increase the percentage of potential excess burden to 3.2%. The direct and excess burden of the potential tax would be borne largely by consumers because imports may represent over 90% of U.S. consumption of off-road motorcycles.

Other all-terrain vehicles. Data were not available to either statistically estimate elasticity or to derive an estimate using Hirshleifer's (1976) four factors of the price elasticity of demand. All-terrain vehicles have a wide range of retail prices, possibly from below \$2,000 to more than \$25,000.

A fairly high price elasticity in the \$2,000 to \$25,000 price range is expected due to the income effect. Vehicles not bought for work-related activities also would be expected to have a high price elasticity because the goods are not a necessity. A price elasticity of 5 was assumed. This was higher than the price elasticity for off-road motorcycles (1), but less than the price elasticity for four-wheel drive vehicles (10 to 15).

The economic efficiency loss of a 2% tax on all-terrain vehicles would likely be in the range of 10%, if firms were able to shift the entire tax to consumers. If firms utilize resources specific to the all-terrain vehicle industry and, therefore, are forced to absorb part of the tax, the percentage excess burden could be as low as 5%.

A 5% tax likely would have a significant economic efficiency loss, particularly on recreation-oriented all-terrain vehicles when compared to all-terrain vehicles primarily used for work. The percentage excess burden of a 5% tax could be as high as 20% or \$0.20 per dollar of tax revenue.

Four-wheel drive vehicles. The demand and supply for four-wheel drive vehicles is quite price sensitive. The supply and demand for Ford, Chevrolet, and Dodge four-wheel drive vehicles had price elasticities of 15 in 1980. Given the equality of price elasticities of demand and supply, the potential excess burden would be split equally between producers (and their resource suppliers) and consumers. The price elasticity of demand for Jeeps also is quite price sensitive, with a price elasticity of 10 in 1980. The total excess burden of a 2% tax on all four-wheel drives would be \$5.56 million annually. This represents 8.3% or \$0.083 of economic efficiency loss per dollar of tax revenue collected. A 5% tax would result in an excess burden of \$34 million annually. This represents a 27% economic efficiency loss or \$0.27 of economic loss per dollar of tax revenue. This is a very high economic efficiency cost associated with a 5% tax. The potential excess burden of \$34 million would be split between consumers and producers.

#### Excess Benefit

A reduction in the quantity of snowmobiles, four-wheel drive vehicles, and off-road motorcycles sold would have the benefit of reducing negative spillover effects (externalities) associated with certain uses of these vehicles. That is, the purchase price and cost of operating these machines is only a portion of the cost borne by society as a whole. A reduction in the quantity of these vehicles purchased would generate an "excess benefit" or benefit in excess of tax revenue collected. The excess benefit reflects the improvement in economic efficiency from reducing the quantity of these vehicles to a more socially optimal level (Boadway 1979; Musgrave and Musgrave 1980; Due and Friedlaender 1981).



The degree of the negative externalities and the extent of related excess benefits through taxation are discussed separately for snowmobiles, four-wheel drive trucks, and off-road motorcycles because each class of vehicles has its own type of impacts.

Snowmobiles appear to have the smallest negative externalities. Bury (1978) and McCool (1978) summarized many studies of snowmobile impacts on wildlife. The impacts in terms of stress, habitat destruction, and interference in animal movement seems to be concentrated on smaller mammals and on elk (Bury 1978). Intentional harassment of wildlife by snowmobiles is quite detrimental to wildlife in the winter when food is scarce.

According to a study by the U.S. Geological Survey, off-road motorcycles and four-wheel drive vehicles have significant impacts on soil and vegetation (Wilshire et al. 1978). Off-road vehicles destroy bird nests and vegetation in desert environments (Luckenback 1978). Bury et al. (1977) found that off-road vehicle use substantially lowers abundance and diversity of small mammals in the California desert.

Direct effects of off-road vehicles on wildlife have been documented at Back Bay and Cape Romain National Wildlife Refuges (Sheridan 1979). At Back Bay Refuge, off-road vehicles were destroying sand dunes that had cost the Federal government an estimated \$500,000 to stabilize (Sheridan 1979). Sheridan (1979) suggested that an excise tax be levied on off-road vehicles, and the tax funds used for the reclamation of areas damaged by those vehicles.

Although techniques exist to estimate the dollar amount of excess benefits, no such data are directly applicable to off-road vehicle and snowmobile damage. However, the likelihood of substantial excess benefits may be recognized as a result of a reduced demand for off-road vehicles.

### Benefits Received

An excise tax on four-wheel drive vehicles, off-road motorcycles, trail bikes, three wheelers, and snowmobiles would probably have a positive, but not strong, relationship to benefits received. Kellert (1980) indicated that off-road vehicle users have a strong wildlife orientation and have significantly greater knowledge of wildlife than nonparticipants. Therefore, an excise tax on off-road vehicles would be somewhat related to benefits received because off-road vehicle users would benefit from tax-financed management efforts that increased the number and diversity of species in recreation areas. No data were available, however, to quantify the exact role wildlife has in recreational satisfaction associated with using off-road vehicles or the percentage of use of off-road vehicles primarily for nonconsumptive wildlife activities. A large percentage of off-road vehicles are used in recreational activities largely unrelated to wildlife; only 10% of off-road vehicle users indicated they heard or saw wildlife on trips not taken primarily to see wildlife (Kellert 1980).

Survey data developed by Power and Associates (1982), provided by the Motor Vehicle Manufacturers Association, showed that only 12 to 14% of four-wheel drive vehicle owners "frequently" used these vehicles off the road.

Although no definition of "frequently" was provided, the implication was that the vehicles were not primarily used for off-road recreation. Data from the 1977 Census of Transportation, Truck Inventory and Use Survey for four-wheel drive trucks also provided by the Motor Vehicle Manufacturers Association, showed that personal transportation was the major use (66%), with agricultural use second at 17%. However, recreation was not a separate category and was likely considered a component of personal transportation.

According to Stu Bengson, Director of the Land Use for United Four-Wheel Drive Association, nearly 75% of four-wheel drive vehicles are owned by individuals for recreation purposes (Four Wheeler Magazine, May 1984). Mr. Bengson went on to say "I'd guess that at least 90% of the four-wheelers are environmentalists and have an appreciation for nature" (Four Wheeler Magazine, May 1984:90). Ford Motor Company estimated that about 57% of their trucks are used at least part of the time for recreational purposes, including towing boats, trailers, or carrying campers (Ward's Communications, Inc. 1970). The category of recreational uses, hunting, fishing, and camping was the second most important reason for buying a four-wheel drive in a survey of buyers of small trucks, including those with four-wheel drive (Newsweek 1982a). Depending on which of the above statements is most accurate, the benefits received linkage varies from weak to moderate.

#### Ability to Pay

Table B-13 represents the most closely related data set for evaluating ability to pay for motorcycles and small four-wheel drive trucks. Data were not available for off-road motorcycles or for all four-wheel drive vehicles. However, over half the motorcycles are used off the road at some time (Motorcycle Industry Council 1982). Persons making less than \$10,000 per year represent 23% of the population, but only 9.1% of all motorcycle owners. Above this income bracket, the percentage of motorcycle owners and the percent of population in an income bracket are about the same until mid-upper income levels, where the percentage of motorcycle owners falls faster than percent of the population in an income bracket. Actual tax payment would likely rise as household income increased. In addition, the burden on the lowest income households would be minimal because of the small percent of motorcycle owners in this income bracket. However, the tax likely would be slightly regressive, with the higher income classes, as a group, paying a lower percentage of the tax relative to their proportion of the population.

The average age of motorcycle owners is 26.9. Sixty-two percent of motorcycle owners are 30 or younger, even though that age class represents only 26% of the population. Therefore, a substantial portion of a tax on motorcycles would be borne by teenagers and young adults.

A survey of small truck buyers indicated trends similar to those for motorcycle owners. A majority of the tax payment would probably come from middle and upper income households. The tax, as measured by the Suits Index, likely would be slightly progressive because middle and upper income groups (\$25,000+) represent about one-third of the population but would pay over 50% of the tax. This survey did not pertain to four-wheel drive vehicles specifically. However, a tax on this type of vehicle is expected to be even more progressive because of their greater expense.

Table B-13. Income levels related to ownership of motorcycles and small four-wheel drive trucks.

Income	U.S. population (U.S. Department of Commerce 1982)	Motorcycle owners (Motorcycle Industry Council 1982)	Small truck owners (Newsweek 1982a)
Under \$10,000	23.4%	9.1%	4.3%
\$10-14,999	13.4%	13.0%	7.6%
\$15-19,000	11.8%	13.9%	9.0%
\$20-24,999	10.8%	12.9%	12.0%
\$25-34,999	18.6%	12.5%	26.2%
\$35-49,999	13.5%	5.9%	23.5%
\$50,000 and over	8.6%	2.4%	17.3%
Unknown		30.3%	

Income information for purchasers of four-wheel drive vehicles was not available. Data from the Motor Vehicles Manufacturers Association of the United States (1979) showed that, as income rises, more families own two or more vehicles. The Bureau of Labor Statistics Consumer Expenditure Survey (U.S. Department of Labor 1978) indicated that increases in annual expenditures for cars and trucks almost keeps pace with increases in income, suggesting that a tax would be nearly proportional. Given the large variation in the prices of four-wheel drive vehicles and related options, it is likely that the expenditure per four-wheel drive vehicle rises as income rises. Thus, a tax on four-wheel drive vehicles may be proportional.

The available data on the progressivity of excise taxes on new cars and trucks indicate that potential excise taxes would be barely regressive or nearly proportional, based on a Suits Index of -0.04 (Rock 1983). Based on this information, a tax on four-wheel drive vehicles is expected to be at least proportional and could be progressive. Specific data on the income of four-wheel drive buyers are needed before a more definitive statement can be made.

I. EXCISE TAX OF 5 TO 10% ON BINOCULARS, MONOCULARS, AND SPOTTING SCOPES,  
LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

Product/Source Definition

This potential funding source includes binoculars, monoculars, and spotting scopes. Binoculars and monoculars are short, compact optical instruments that magnify images and improve observation under reduced light conditions, such as dusk or twilight, particularly when coated optics are provided. They generally can be carried and handled by most individuals for purposes such as observing birds and other wildlife or sport and racing events. Field glasses were included within the broader definition of binoculars. A few binoculars and monoculars are large instruments, designed to be used with fixed or mobile mounts. They typically are used for tourist overlooks and military or marine observation and are included as binoculars or monoculars. Spotting scopes, frequently used to locate animals or other objects, also are included. Spotting scopes generally have a larger objective lens and longer length than monoculars. The larger lens and increased length provide increased magnification, perhaps as much as 60X power, compared with the 4X to 10X power typical of binoculars and monoculars. Spotting scopes usually are used with tripods or other stands because of their higher magnification, longer length, and increased weight. Tripods and other support devices would be included as potential taxable items only when permanently attached to a spotting scope or sold as a package component with a scope. Opera glasses, lorgnettes, scientific, cartographic, and similar specialized optical instruments were excluded from this group of products.

The potential taxation of binoculars, monoculars, and spotting scopes would be facilitated by the fact that there are relatively few, highly specialized companies, at known locations, producing these products. Similarly, there are relatively few foreign producers and importers.

Funding Potential

Price elasticity data for these products were not available. Fortunately, the market characteristics of binocular production and sales in the U.S. provided data that could be used to estimate a demand equation for this product. Most binoculars sold in the U.S. are imported; domestic producers account for about 15% of the total retail sales (Flood pers. comm.). Although historical series or cross-sectional data on domestic production were not available, both quantity and value data for imports were compiled for 1950 to 1981 from information in the following reports produced by the Bureau of the Census, U.S. Department of Commerce:

FT110 U.S. Imports of Merchandise for Consumption  
FT125 U.S. Imports of Merchandise for Consumption  
FT410 U.S. Foreign Trade Commodity by Country, Schedule B, Commodity  
Quantity and Value

Other data were obtained from sources identified below. No data were found on monocular production or sales.

The historical series of data on the quantity and value of imports for U.S. consumption was used to estimate a simple demand equation in order to project future sales and estimate the effects of various levels of taxes. A supply curve could not be estimated because of the lack of data on material costs. It was assumed that the supply curve was approximately horizontal in the range of output affected by the specified tax rates (Pechman and Okner 1974; Musgrave and Musgrave 1980). This assumption appears reasonable for binoculars for two reasons. First, about 85% of total sales is produced by foreign firms, for which the U.S. is but one of many "price taker" markets influencing, but not determining, price. Second, the domestic binocular industry represents only 0.06% of the domestic optics industry. Thus, the binoculars industry can expand or contract over the long run, within the range of quantity change estimated below, as a result of the potential tax rates, while maintaining relatively constant unit costs. Both constant long run per unit costs and a price taker market structure imply a long term horizontal industry supply curve to domestic purchasers of binoculars. Given this price taking behavior, the demand can be estimated without concern for simultaneous equation bias.

The first estimated demand curve exhibited possible autocorrelation, as indicated by the Durbin-Watson statistic. The probable serial correlation was corrected by using the Cochrane-Orcutt procedure (Kmenta 1971). The resulting equation was:

$$Q = 0.252 + 0.002486DPI - 0.3638P$$

(4.59)\*\*\*      (-1.93)\*

where      Q = quantity per million population

P = relative price in 1972 dollars

DPI = real disposable per capita personal income in 1972 dollars

\* = statistically significant at the 90% level

\*\*\* = statistically significant at the 99% level

t values are given in parentheses. The  $R^2$  was 0.56, and the Durbin-Watson statistic was 1.64. The sample size was 31.

The equation served as a useful evaluation tool for projecting future sales and assessing economic efficiency because of the predominance of imported binoculars in the domestic market. The demand equation was used to project the unit sales of binoculars in the year 2000, as well as to estimate the relative impact of the potential taxes in 1980 and 2000. The projected unit sales for the year 2000 were estimated based on the most likely population projection by the Bureau of Census (U.S. Department of Commerce 1982), adjusted to domestic residents, and personal income projected to the year 2000 by the

Bureau of Economic Analysis (U.S. Department of Commerce 1981b), adjusted to disposable personal income. The estimated imports of binoculars in 1980 and 2000 were increased by 15% to account for domestic shipments (Flood pers. comm.). The estimated binocular sales were adjusted upward by 6.2% to incorporate spotting scope sales, based on the volume of 1980 retail sales reported in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). This adjustment assumed that sales of spotting scopes would increase at the same rate as binoculars to the year 2000 and that the wholesale-retail markups for spotting scopes and binoculars are the same. Spotting scopes and binoculars typically are sold through the same distribution channels. Similar or identical wholesale-retail margins are likely to exist.

No data were obtained for monocular or field glasses unit or dollar sales. Therefore, an excise tax on these items would increase the net revenues estimated for binoculars and spotting scopes in Table B-14.

Retail purchases of binoculars and spotting scopes of \$141.3 million were reported in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). This figure includes \$8.3 million in purchases of spotting scopes, estimated from a small sample size. Data developed in 1972 by the Bureau of Economic Analysis, U.S. Department of Commerce, indicated that about 34.5% of the retail sales of optical instruments and lenses, which includes domestic production of binoculars and spotting scopes, were income to producers (Horowitz 1983). Multiplying \$141.3 million [combined retail sales of binoculars and spotting scopes reported in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982)] by 34.5% yielded estimated manufacturer/importer sales of \$48.8 million. This compares closely with the \$47.6 million in untaxed manufacturer/importer sales shown in Table B-14. The \$47.6 million in estimated sales includes imports of binoculars plus estimated domestic production of binoculars (15%) and spotting scopes (6.2%).

Table B-14. Estimated potential annual sales of, and tax revenue from, binoculars and spotting scopes (thousands of units and millions of 1980 dollars).

Potential tax rate	1980				2000			
	Quantity	Gross sales	Net sales	Potential tax revenue	Quantity	Gross sales	Net sales	Potential tax revenue
0	1,839.0	47.6	47.6	0	4,240.0	109.8	109.8	0
5%	1,802.0	49.0	46.7	2.3	4,196.0	114.1	108.7	5.4
10%	1,765.0	50.3	45.7	4.6	4,152.0	118.2	107.4	10.8

The net revenue estimates were based on the following assumptions:

1. A shift has occurred away from purchases of domestically produced binoculars to imports. However, the extent of this change is unknown because of the lack of data on domestic production.
2. Historical unit and dollar sales data on spotting scopes, monoculars, and field glasses are lacking.
3. The wholesale-retail margin for spotting scopes is the same as that for binoculars.
4. The overall optics industry income of 34.5% of the retail sales paid to producers/importers is the average payment to producers and importers of binoculars and spotting scopes.
5. Purchases in the year 2000 will reflect the same trends as purchases in 1980.

Errors in the estimated tax revenues resulting from these assumptions is unknown.

Binoculars are classified as Tariff Schedules of the United States item 708.52. The rate of duty for these products in 1980 was 18.5%. Public Law 96-461 removed all duty on these articles on October 17, 1980. The duty free status of binoculars is scheduled to continue through 1987 (U.S. International Trade Commission 1983e). Monoculars and spotting scopes also may be imported duty free from less developed countries. However, the extent of these duty free imports, if any, is unknown.

The duty collected under existing rates in 1980 from imports of binoculars and field glasses was not estimated because these products were duty free as of October 17, 1980. The potential excise taxes to fund State wildlife programs would represent new import duties, which would change the duty free status of these products, scheduled through 1987.

Monoculars and spotting scopes are classified under Tariff Schedules of the United States item 708.58, which includes other, unspecified telescopes. The rate of duty for item 708.58 was 18.5% in 1980, with scheduled reductions to 8% in 1987 (U.S. International Trade Commission 1983e). Data were not available on the quantity, value, and origin of monoculars and spotting scopes because these products are not specifically identified in the Tariff Schedules of the United States. Tariff revenues on monoculars and spotting scopes under existing rates of duty were not estimated due to lack of data.

The potential taxes of 5 to 10% would have yielded about \$2.0 to \$3.9 million in duty from imports in 1980, assuming that about 85% of spotting scopes and binoculars were imported. The estimated potential revenue of \$2.0 to \$3.9 million was included in the potential revenue estimated above.

### Economic Efficiency

The reduction in economic efficiency resulting from the tax (excess burden), and relative to the revenue generated, can be calculated from the demand curve for binoculars. The annual excess burden from a 5% tax would be \$16,400 or 1%. The annual excess burden of the tax in 1980 was estimated at \$92,200 for a 10% tax on binoculars at the manufacturers' level. This represents less than a 2% loss due to the tax or a loss of \$0.02 per dollar of tax revenue. This is less of an excess burden per dollar of tax revenue than the corporate income tax (Boadway 1979). This small amount of excess burden is consistent with the low price elasticity of demand for binoculars of -0.44, estimated from the equation. Therefore, taxation of binoculars would yield revenue with minimal economic distortion, consistent with the "Inverse Elasticity Rule" (Boadway 1979). Levying taxes on spotting scopes and monoculars might increase the excess burden but the level of increase would be small, based on the burden resulting from taxing binoculars. The excess burden might even be reduced because spotting scopes and monoculars sometimes are substitutes for binoculars. Therefore, consumer switching behavior might be minimized and the excess burden reduced if all monoculars and spotting scopes were included with binoculars.

### Benefits Received

The benefits received relationship for binoculars, monoculars, and spotting scopes is fairly high. Analysis of information in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) by Shaw and Mangun (1984) indicated that about 40% of the persons who purchased or owned binoculars and spotting scopes had nonconsumptive use of wildlife as their primary purpose. The other major wildlife-related use probably is hunting.

Payne and DeGraaf (1975) indicated that about one-half of the total dollar sales of binoculars are to persons for whom birdwatching is a primary or secondary activity. Of particular interest is the fact that approximately 75% of the more expensive binoculars (costing more than \$250 in 1974) were bought by birdwatchers. Therefore, birdwatchers would pay a greater percentage of the tax on a per purchaser basis. The benefits received linkage appears stronger when the benefits received view is broadened to include the purchase of binoculars for other wildlife and outdoor activities. The benefits received linkage is reduced because many people who would potentially benefit from wildlife management activities do not buy binoculars.

### Ability to Pay

The average retail expenditure by individuals purchasing binoculars or spotting scopes in 1980 was \$57 (Shaw 1983). The average tax payment at the 10% tax rate would be around \$2 to \$3 per household in the year of purchase. Above average expenditures are made by persons in the 25 to 64 age brackets. Binoculars are durable goods lasting for several years; the annualized tax payment would be \$1 or less. Using the Suits Index (1977), the tax progressivity is -0.28, indicating that the tax is relatively regressive. Although regressivity is of concern, a tax on the extremely small percentage of income spent on this good would not have a perceptible impact on any income class.



There is reason to believe that the slope of the supply curve for binoculars and spotting scopes in the region of the quantity change under study may be horizontal, in which case all of the direct tax burden would fall on consumers. In this case, the Suits Index measures the overall progressivity of the tax on binoculars in the long run. Given that 85% of domestic purchases of binoculars are imports, any short term dislocation and adjustment costs or long term burden would be substantially borne by foreign, rather than domestic, producers.

J. EXCISE TAX OF 5 TO 10% ON WILDLIFE IDENTIFICATION BOOKS, LEVIED AT THE PUBLISHER/IMPORTER LEVEL

Product/Source Definition

Books published in the United States have three identification numbers. Two of the numbers, the International Standard Book Number and the Library of Congress Catalog Card Number are not suitable for defining wildlife identification books because they are access numbers that have no relation to a book's content. The International Standard Book Number is based on the language, publisher, and editor of a book, and the Library of Congress Catalog Card Number is based on the date of publication (Mueller 1976; Armstrong 1979).

The Library of Congress book classification system is subject-based and could be used to identify field guide books for a potential tax. In the Library of Congress system, wildlife books are classified under the major heading QL (Zoology), which is further divided into subheadings, such as Birds. Each subheading is broken down into more specific categories, such as Periodicals. A "Field Guides" category within each subheading does not exist (except for Spiders). Wildlife field guides most commonly occur in the category Geographic Distribution. Although some books within this category are not strictly field guides, they all deal with the identification and/or appreciation of wildlife species and are, therefore, of interest to wildlife enthusiasts.

Further definition within the Library of Congress classification system (beyond geographic distribution, in this case) is keyed to the last name of the author. A definition at this level would entail identifying the complete Library of Congress classification number for every wildlife field guide in circulation. This method would narrow the definition to include only field guides, but would either require continual updating to accommodate new books by different authors or exclude future publications.

If the Library of Congress system was used in the administration of an excise tax on wildlife identification books, publishers would have to obtain and print the Library of Congress classification number on all books. This procedure currently is not mandatory. A law restricting copyright registration to books with Library of Congress classification numbers would provide incentives for publishers to comply with this procedure.

## Funding Potential

Retail purchases of wildlife identification books in 1980 were estimated at about \$18 million, based on the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982). Data developed for 1972 by the Bureau of Economic Analysis, U.S. Department of Commerce, indicated that about 58.3% of book publishing industry retail sales was income to publishers (Horowitz pers. comm.). Therefore, estimated shipments were approximately \$10.5 million, which would have yielded \$0.5 to \$1.0 million in potential gross revenue, based on 5 to 10% excise tax rates. Potential revenue estimates were based on the following assumptions:

1. The 58.3% portion of retail book sales paid, on the average, to producers also applied to publishers of wildlife identification books.
2. The publishers' share of retail sales value in 1972 is the same for 1980 and 2000.

Future growth in book sales is likely to be quite strong. Trend data from Vanier (1973) showed a doubling of copies sold from 1958 to 1970. If these trends continue, tax revenue in the year 2000 could be as high as \$2.0 million at the 5% tax rate and \$4.0 million at the 10% rate, assuming that the quantity sold is not reduced because of the higher prices resulting from a potential excise tax (see Economic Efficiency section).

Wildlife identification books are included in the Tariff Schedules of the United States as item 270.25 Books, not specially provided for (U.S. International Trade Commission 1983f). The term "book" includes imports of bound and unbound books and pamphlets. These articles are duty free under the Florence Agreement of 1967 (Stahmer pers. comm.). Therefore, no import duty was collected in 1980, and none is anticipated in the year 2000 under existing tariffs.

No data were available on imports of wildlife identification books. However, an informal survey of a major book retailer identified 9% of the wildlife identification books as imported. Therefore, the revenues from a potential excise tax for State wildlife programs would include potential revenues from 5 to 10% import duties of \$45,000 to \$90,000 in 1980 and from \$180,000 to \$360,000 in 2000. Collection of these potential revenues would require modification of the Florence Agreement of 1967.

## Economic Efficiency

Books covering a specialized topic, such as field guides, can often be close substitutes for each other; however, books on different topics are not usually adequate substitutes (Vanier 1973). Consequently, nontaxed books (books on other topics) could not be substituted for wildlife identification books. Field guides are a necessary information source for persons interested in the field identification of wildlife species for scientific or recreational purposes, and no acceptable substitute for that information source exists.

The lack of substitutes for wildlife identification books is reflected in their inelastic demand. Demand for books (in general and for particular types of books) is highly correlated with income, education, occupation, age, and race, but not with price (Link and Hopf 1946; Houthakker and Taylor 1966; Vanier 1973; Dessauer 1983). Examination of book sales and prices over time showed that both quantity sold and prices consistently increased, while sales generally increased even faster. Within the category of professional/scientific books (which included field guides), the number of copies sold from 1958 to 1970 increased by 115.4%, while the average price increased by 52.8% (Vanier 1973). These data suggest a strong consumer interest in these specialized books.

An excise tax levied on field guide publishers, passed on as an increased price to consumers, should not result in any significant decrease in the quantity of field guides sold as long as interest in the field identification of wildlife remains strong. Revenue should remain the same as that estimated for current sales, assuming little or no change in the quantity sold at increased prices resulting from a potential tax.

Assuming little change in the quantity sold, the amount and percent of excess burden would be quite small. Book publishers likely would not bear any of the excess burden, because resources used to publish wildlife identification manuals generally may be used to publish other books instead, with little or no change in earnings. Authors of wildlife identification manuals might bear a portion of any excess burden because these authors have specialized skills related to wildlife topics and would not likely earn the same income in alternative occupations. However, consumers would bear the bulk of any excess burden.

#### Benefits Received

The benefits received relationship is strong. It is likely that most of the field guides purchased are intended for individuals who observe wildlife. These people would benefit directly from wildlife management financed by an excise tax because it would increase the number and diversity of species, increase wildlife habitat, and provide for the acquisition of land or public access by States.

#### Ability to Pay

With an average retail expenditure of \$10, the absolute amount of tax paid, even with a 10% tax at the publisher level, would only be \$0.50. Average annual expenditures rise with age up to the 45 to 54 age bracket (\$25.36) and then fall to \$12 at the 65 and over age bracket. Although an excise tax on wildlife identification manuals would be regressive, less than one-hundredth of 1% of a household's income would go to pay the tax.

K. FEES OF \$0.50 TO \$2.00 (NEW FEES OR SURCHARGES ON EXISTING FEES) ON THE USE OF SELECTED FEDERAL LANDS AND WATERS

Product/Source Definition

Seven agencies within the Federal Government provide recreational opportunities: Bureau of Land Management; Bureau of Reclamation; Fish and Wildlife Service; National Park Service; Army Corps of Engineers; Forest Service; and Tennessee Valley Authority. This analysis does not include Department of Defense lands, other than those of the Army Corps of Engineers. Lack of consistent data on the recreation activities managed by these agencies makes estimation of revenues difficult. Definitions and accounting procedures vary among agencies; there are different legislative instructions regarding the provision and allocation of recreation; and differences exist in the type of land the agencies manage, accessibility, attributes for providing public recreation, and the relative emphasis the agencies place on recreation compared to other resource uses. Because of these differences, two approaches were followed for this section of the study. The first approach utilized information found in the Federal Recreation Fee Report, 1982, compiled by the U.S. National Park Service (1982). Aggregate data on visitor use and revenue for each of the seven agencies were used to estimate potential revenues if new fees of \$0.50 and \$2.00 were charged for every visitor day on these Federal lands.

The second approach analyzed data that were more detailed for each agency. It utilized the General Accounting Office Report to Congress on Entrance Fees (1982) and the President's Private Sector Survey on Cost Control (1983), to estimate potential revenues for the National Park Service, the Forest Service, and the Army Corps of Engineers. Similar detailed information was obtained directly from the Fish and Wildlife Service National Wildlife Refuge System Public Use Report (1983) and the Bureau of Reclamation Annual Report (1981) for those two agencies. Detailed data on the recreational use of Tennessee Valley Authority and Bureau of Land Management resources were not available and, therefore, were not included in the second approach.

The President's Private Sector Survey and the General Accounting Office report were not specifically for the year 1980. However, these two data sources consistently emphasized estimates for the 1980 to 1982 period. Therefore, it was assumed that these estimates adequately reflected potential 1980 revenue and could be compared with other potential revenue sources for that year.

Projections to the year 2000 were made using indexes estimated from demand equations for all land-based recreation participation (Hof and Kaiser 1983). Three levels of demand determinants, which included population, leisure time, education, income, and other factors, were reported. The medium level was used in this analysis, resulting in potential revenue projections for the year 2000 that were 120% above the estimates for 1980, in 1980 prices.

## Funding Potential

The Federal Recreation Fee Report, 1982 (U.S. National Park Service 1982) stated that there were 6,366.9 million total visitor hours to the seven Federal agency lands in 1980. Assuming each visit was for an average of 12 hours, there were 530.6 million visitor days. If the fee for each visitor day was \$0.50, \$265.3 million in gross revenue would be generated. Based on National Park Service and Forest Service experience, 20% of the gross revenue would be needed to cover collection fees, leaving \$212.2 million in net revenue. With a \$2.00 per visitor day fee, the corresponding total net revenue estimate would be \$848.9 million. These estimates assume that all visits to lands belonging to the seven Federal agencies would result in \$0.50 or \$2.00 for wildlife conservation. Where fees are already being charged, a surcharge of \$0.50 or \$2.00 would be added, and visits that were free of charge in 1980 would incur a new fee of \$0.50 or \$2.00.

If only those visits to nonfee units in 1980 are considered, 5,035.9 million visitor hours or 419.6 million visitor days are involved. In that case, net revenues of \$167.9 million would be generated from a \$0.50 charge, and a \$2.00 charge would yield net revenues of \$671.4 million. A breakdown of potential net revenues by agency is given in Table B-15.

The above estimates may not be realistic because fee collections are not always economically viable, especially on remote lands involving highly dispersed recreation activities. Permits or licenses might be used in this situation, but compliance may be reduced, and the cost of surveillance and monitoring may be high. Further, the number of visitor days would decrease as the price (fee) per visitation increased. Because of these difficulties, more realistic estimates of revenue generation potential were estimated based on several individual Federal agency reports on visitor charges.

Fish and Wildlife Service refuges. The National Wildlife Refuge System Public Use Report (U.S. Fish and Wildlife Service 1983) (Table B-16) indicated that there were 30,437,000 visits to wildlife refuges in 1982. Utilizing the range of fees suggested for the National Park Service by the General Accounting Office (1982), a fee of between \$0.50 and \$2.00 per person would have yielded between \$15.2 and \$60.8 million in 1982. If a midrange fee of \$1.00 per visitor were charged, gross revenue would have been \$30.4 million. Assuming that 20% of the revenue would cover collection costs, \$24.4 million would have been available from user fees for fish and wildlife conservation and enhancement. These estimates assumed that all visits to all Fish and Wildlife Service refuges would be assessed a visitation fee.

National Park Service. In the General Accounting Office study of National Park Service entrance fees (General Accounting Office 1982), it was estimated that an additional \$20.7 million in net revenue could be collected each year. This included \$10.9 million from increased entrance fees at 25 National Park Service units, \$2.7 million from longer collection hours at 14 units, \$5.3 million from initiating collection fees at 23 units, and \$1.8 million from increasing the price of Golden Eagle Passports from \$10.00 to \$25.00 per year. This is a conservative estimate, because only 45 nonfee areas were reviewed. The National Park Service indicated that new or increased fees may

Table B-15. Visitor days and potential net revenue by agency, 1980 (thousands).

Agency	Fee unit visits			Nonfee unit visits			Total visits		
	No. of visitor days	Net revenue at \$0.50	Net revenue at \$2.00	No. of visitor days	Net revenue at \$0.50	Net revenue at \$2.00	No. of visitor days	Net revenue at \$0.50	Net revenue at \$2.00
Bureau of Land Management	2,703.0	1,081.2	5,406.0	2,989.4	1,494.7	5,978.8	5,692.4	2,846.2	11,384.8
Bureau of Reclamation	150.2	60.1	300.4	33,781.4	16,890.7	67,562.8	33,931.7	16,965.9	67,863.4
Corps of Engineers	8,770.9	3,508.4	17,541.8	151,758.0	75,879.0	303,516.0	160,529.0	80,264.5	321,058.0
Fish and Wildlife Service	47.9	19.2	95.8	1,403.3	701.6	2,806.6	1,451.2	725.6	2,902.4
Forest Service	27,546.4	11,018.6	55,092.8	207,353.0	103,676.5	414,706.0	234,899.4	117,449.7	469,798.8
National Park Service	71,107.9	28,443.2	142,215.8	15,699.0	7,849.5	31,398.0	86,806.8	43,403.4	173,613.7
Tennessee Valley Authority	593.4	237.4	1,186.8	6,674.4	3,337.2	13,448.8	7,267.8	3,633.9	14,535.6
Total	110,919.6	44,367.8	221,839.2	419,658.6	167,863.4	671,453.7	530,578.3	265,289.2	1,061,156.6

Table B-16. Potential revenue estimates from visitor fee collections on wildlife refuges, Fiscal Year 1982<sup>a</sup>.

Activity	Visits (millions)	Gross revenue (\$ millions)			Net revenue (\$ millions) <sup>b</sup>		
		at \$0.50 fee	at \$1.00 fee	at \$2.00 fee	at \$0.50 fee	at \$1.00 fee	at \$2.00 fee
Interpretation	5.6	2.8	5.6	11.2	2.2	4.5	9.0
Education	0.1	0.1	0.1	0.2	0	0.1	0.2
Hunting	1.1	0.6	1.1	2.2	0.5	0.9	1.8
Fishing	5.0	2.5	5.0	10.0	2.0	4.0	8.0
Other consumptive wildlife uses	0.7	0.4	0.7	1.4	0.3	0.6	1.1
Nonconsumptive wildlife recreation	13.8	6.9	13.8	27.6	5.5	11.0	22.1
Nonwildlife recreation	4.1	2.0	4.1	8.2	1.6	3.3	6.6
Total use <sup>c</sup>	30.4	15.2	30.4	60.8	12.2	24.3	48.6

<sup>a</sup>U.S. Fish and Wildlife Service National Wildlife Refuge System Public Use Report (1983).

<sup>b</sup>Fee collection costs of 20% are assumed, based on the General Accounting Office Report (1982) and the President's Private Sector Survey on Cost Control (1983).

<sup>c</sup>Columns may not total exactly due to rounding.

be warranted at many of the 262 park units not included in the General Accounting Office review. Fees were judged to be economically infeasible at only 22 of the 45 units studied (General Accounting Office 1982). In a study of methods to reduce expenditures and generate new sources of revenue for the Federal Government, the General Accounting Office estimates were increased from \$20.7 to \$30 million to reflect potential revenue from other park units (President's Private Sector Survey on Cost Control 1983). This \$30 million estimate was used for the National Park Service (Table B-17).

Forest Service. The President's Private Sector Survey on Cost Control (1983) estimated that the potential gross revenue from increases in special user charges, annual entrance permits, and other entrance charges would be at least \$125 million. Because 20% of the Forest Service revenue from recreation fees have historically been spent on collection costs, the Survey estimated that \$100 million of net revenue would be added during the first year of new fee structures, presumably representative of the 1980 target year considered in the present study (Table B-17).

Army Corps of Engineers. The President's Private Sector Survey on Cost Control (1983) used Corps of Engineers' estimates to conclude that \$15 million in additional net revenue could be raised from recreational charges (Table B-17). These net revenues would come from a combination of a \$2.00 entrance fee per private noncommercial vehicle, a \$0.50 charge for other means of entry, and an annual entrance pass that sold for \$20.00.

Bureau of Reclamation. The Annual Report of the Bureau of Reclamation estimated that 45.8 million 12-hour visitor days were spent at Bureau of Reclamation facilities in 1981 (U.S. Bureau of Reclamation 1981). If a fee of \$1.00 per visitor day was collected for these visits and 20% of the revenue used for collection costs, Bureau of Reclamation user fees could yield \$36.6 million of net revenue (Table B-17).

The potential revenue from all five Federal agencies is summarized in Table B-17. If 50% of the net revenue generated by the five agencies was available, there would be a total of \$103.1 million in potential funding from user fees.

Both the General Accounting Office Report (1982) and the President's Private Sector Survey Report (1983) emphasized the importance of covering fee collection costs, as well as operation, maintenance, rehabilitation, and construction needs out of the user-generated revenues. Gross revenues reported in this study were reduced by 20% to cover the average cost of collections; 50% of the resulting net revenues were assumed to remain with the collecting agencies for operations, maintenance, and development costs. The 50% suggested for use in wildlife conservation programs may be thought of as a capital improvement investment. Clearly, one of the most unique attributes of public lands is the wildlife population.



Table B-17. Potential revenue resulting from recreational charges by agency (millions of 1980 dollars).

Federal agency	Available funds			Maximum potential net revenue
	at 25%	at 50%	at 75%	at 100%
Fish and Wild- life Service	6.1	12.2	18.3	24.4
National Park Service	7.5	15.0	22.5	30.0
Forest Service	25.0	50.1	75.0	100.0
Army Corps of Engineers	3.8	7.5	11.2	15.0
Bureau of Reclamation	9.2	18.3	27.4	36.6
Total	51.6	103.1	154.4	206.0

The maximum potential net revenue of \$206.0 million is more than 10 times larger than the \$18.6 million net revenue actually collected by all seven Federal agencies in 1980 (Table B-18). Relevant recommendations of the President's Private Sector Survey on Cost Control (1983) would have to be implemented if this increase in potential fees were to be realized. These recommendations generally are consistent with similar projections made by the General Accounting Office report and accepted by the U.S. Department of the Interior (General Accounting Office 1982).

Table B-18. Actual fees collected, direct costs incurred, and net revenue by agency, 1980 (\$ thousands). Data obtained from U.S. National Park Service (1982), Federal Recreation Fee Report.

Federal agency	Total fees collected	Direct costs	Net revenue
Fish and Wildlife Service	96	50	46
National Park Service	13,577	4,006	9,571
Forest Service	6,687	2,101	4,586
Army Corps of Engineers	5,227	1,848	3,379
Bureau of Reclamation	591	439	152
Bureau of Land Management	444	126	318
Tennessee Valley Authority	<u>430</u>	<u>103</u>	<u>327</u>
Total	27,052	8,673	18,379

#### Economic Efficiency

National estimates of consumer surplus and producer surplus of relevant outdoor recreational services were not available, and excess burden or benefit could not be estimated. The general notion of allocative efficiency still applies, however. If resources are to flow to their highest value, users of recreational services ought to pay the marginal costs of providing recreation. The previous National commitment to provide all recreation on public lands at some price less than its full cost has negated this market test of optimal resource allocation efficiency. Increased charges for recreation on Federal resources could increase allocative efficiency for congested recreation areas. For uncongested recreation sites where the fee exceeds incremental costs, an excess burden would be generated. Although entry fees equalled 7% of National Park Service operation and maintenance costs in 1971, they decreased to only 2% of those costs in 1981 (General Accounting Office 1982).

The National price elasticity of demand for several relevant outdoor recreation activities was estimated for 1972 at  $-0.21$  (Adams et al. 1973). This relatively inelastic coefficient implies that small increases in recreational charges would result in small reductions in the number of visits made to participate in major recreational activities at Federal recreation sites.

Charges at current Federal fee areas are in the general area of \$0.50 per visitor day. Initiation of a \$0.50 charge at nonfee areas, or imposition of a \$0.50 surcharge on existing fee areas, would roughly represent a 100% increase in the entrance fee (user charge) for the recreational experience, but about a 5% increase in typical trip price (primarily travel cost per person), assuming a typical trip cost of \$10 per person. Given the assumed  $-0.21$  price elasticity of demand, the use of Federal recreational areas would be expected to decline by about 1% for most Federal recreation sites if an additional \$0.50 were charged.

This dampening effect would be more important at the \$2.00 per visitor day charge. An increase of 20% in the trip price of the recreational service would result in a potential 4% reduction in the demand for Federal area recreation. The revenue dampening potential of these elasticity coefficients should temper the expectations for the revenue levels reported above.

The more ubiquitous the coverage of increased recreation fees across all Federal recreation lands, the less opportunity for substituting recreational areas whose price does not increase. Therefore, trips to areas with increased fees would not decrease as much if comparable fees were assessed at other Federal recreation areas.

The revenue expectations reported in this analysis do not reflect the downward pressures expected from a downward sloping demand curve. However, this potential for fewer trips requires caution in the interpretation of expected revenue potentials from increased user charges.

#### Benefits Received

Fish and Wildlife Service refuges. Primary wildlife activities are a higher percent of total use at wildlife refuges than at other State and Federal areas (U.S. Department of the Interior and U.S. Department of Commerce 1982). In fact, more potential fees would be collected at wildlife refuges for non-consumptive wildlife recreation visits than for any other activity (Table B-16). Therefore, a very strong benefits received relationship would result if revenues from refuges were used to enhance wildlife populations on or near Federal wildlife refuges. To the extent that wildlife populations were increased in nonrefuge areas, the benefits received linkage would be less direct.

Other Federal agencies. Assessment of a wildlife surcharge on existing entrance fees or initiating new entrance fees at nonfee Federal facilities would have a relatively strong benefits received linkage. Fifty-five percent of Americans 16 years and older (93 million people) participated in some form

of nonconsumptive wildlife activity in 1980 (Shaw and Mangun 1984). Therefore, it is likely that people who pay fees at Federal sites would directly benefit from revenue used to improve wildlife populations and their habitat.

User fees are an almost perfect device for linking charges to the individuals receiving the benefits of programs funded by those charges. That is, the more visits (hence, benefits received), the more fees paid for the management of wildlife.

#### Ability to Pay

Nominal increases in existing fees or new fees of \$0.50 to \$2.00 per visit generally would not have significant impacts on equity or ability to pay. The need for ownership of a car and discretionary income for costs of travel deters the lowest income classes from visiting Federal recreation facilities located a great distance from their homes (Rosenthal et al. 1984).

A \$1.00 fee would represent 0.01% of income for a person in the \$10,000 income class and 0.005% of income for a person in the \$20,000 income class. If a family of four paid \$1 in entrance fees per person for two visits to a Federal site in a year, their total charge would be only \$8, or 0.04% of their income if the family made \$20,000 per year. This level of charges generally would not be burdensome and would not likely have a perceptible influence on the number of trips taken (General Accounting Office 1982).

Empirical evidence from recreation demand studies indicated that the number of visits do not increase in proportion to income (Rosenthal et al. 1984). Therefore, potential fees would be regressive, with the percentage of income required to pay the charge falling as income increases.

#### L. VOLUNTARY CONTRIBUTION BY CHECKOFF ON THE FEDERAL INCOME TAX RETURN

##### Product/Source Definition

In its simplest form, the nongame income tax checkoff is a line on the income tax form that permits the taxpayer to voluntarily donate some portion of his or her refund to a nongame program or to increase the payment for remaining taxes with a contribution to a wildlife program. The amount donated can be deducted as a charitable contribution the following tax year.

The nongame checkoff was first used as a funding mechanism by the State of Colorado in 1978. Oregon followed in 1980, and four additional States had checkoffs in 1981. Thirty-one States currently have nongame checkoff programs. Most States have adopted provisions that enable persons not receiving refunds to donate to the nongame program through an increased tax payment. Other States have adapted the checkoff concept to reflect their particular tax structure. Minnesota, for example, has a tax checkoff that enables individuals overpaying their property taxes to make donations to nongame wildlife programs.

## Funding Potential

The nongame checkoff is a relatively new concept in revenue raising. As a result, empirical research on the subject is very limited. Only one previous study dealt with revenue forecasting (Applegate and Trout in press). This study was concerned primarily with forecasting State checkoff revenues and dealt, especially, with the effects of various forms of advertising expenditures on revenues. A forecasting model tailored to estimating potential revenue from a Federal nongame checkoff was developed for this study.

A data set composed of a pooled cross section of time series State aggregated data was developed. Primary data on total donations to State nongame checkoffs, number of State income tax refunds issued, presence of other checkoffs, presence of upper limits on donations, and ability of persons not receiving refunds to donate were obtained from State wildlife agencies and State revenue departments. Data on personal disposable income, unemployment, total amount of refunds issued, and percentage of public land in each State are listed in Appendix 3 of Harpman (1984).

Using this data set, the following equation was estimated:

$$Y = -0.11 + 0.00081 \text{ AR} + 0.000017 \text{ DI} - 0.0005 \text{ OU} + 0.0051 \text{ REC} +$$

(-0.76)    (4.7)\*\*\*    (1.4)    (-0.093)    (7.6)\*\*\*

$$0.082 \text{ OTR} - 0.24 \text{ OCO} - 0.14 \text{ UL}$$

(2.4)\*\*    (-5.4)\*\*\*    (-3.4)\*\*\*

$$n = 40 \quad R^2 = 0.82 \quad DW = 0.86$$

$$F(7.32) = 21.4 \quad \bar{Y} = 0.35 \quad SER = 0.077$$

where    the numbers in parentheses are the t-statistics of the estimated coefficients

Y = average contribution to the nongame checkoff per tax return with a refund

AR = average refund per tax return with a refund

DI = per capita disposable income

U = unemployment rate

REC = percent of public land in the State

OTR = 1 if nonrefund contributions allowed; 0 if not allowed

OCO = number of other checkoffs on the tax form

UL = 1 if there is an upper limit on donations; 0 if there is not

SER = standard error of regression

\*\* = significant at the 95% level

\*\*\* = significant at the 99% level

The proportion of public land in each State was included as an indicator of wildlife-oriented recreational opportunities.

The Durbin-Watson (D-W) statistic indicated that the hypothesis that no autocorrelation was present must be rejected at the 5% significance level. However, due to the number of time series observations for most States, any attempt to adjust for autocorrelation would result in an unacceptable loss of observations from the sample. Thus, the ordinary least-squares estimated coefficients reported above are unbiased and consistent, but the t-statistics are unavoidably biased.

This model was initially used to develop forecasts of revenue that might have been generated if there had been a Federal nongame checkoff in 1980. The actual 1980 variable values were used. The average Federal income tax refund in 1980 was \$684.13 (U.S. Department of the Treasury 1982), the per capita disposable income was \$8,025 (U.S. Department of Commerce 1983), and the unemployment rate was 7.1% (U.S. Department of Commerce 1984). The percent of public land in the United States in 1980 was 32% (U.S. Bureau of Land Management 1983; U.S. Department of Commerce 1984). It was assumed that persons not receiving refunds could still donate to the nongame checkoff. Hence, the value of OTR in the forecast equation was 1. It also was assumed that there were no other checkoffs on the tax form and no upper limits on donations. Therefore, the values of OCO and UL were both set to 0.

The estimated average contribution was multiplied by the number of refunds issued in 1980, which was 68,232,903 (U.S. Department of the Treasury 1982). The forecasts presented in Table B-19 were obtained using these values and assumptions, as well as the further assumption that State nongame checkoff programs in 1980 would have had no impact on Federal checkoff revenues.

Table B-19. Potential Federal nongame checkoff revenue (millions of 1980 dollars).

Assumption	1980	2000
Nongame checkoff only	56.5	73.5
One other Federal checkoff	40.0	54.5

The estimation equation also was used to forecast the potential revenue that might be expected from a Federal checkoff in the year 2000, based on the following assumptions: (1) The average Federal income tax refund in the year 2000 was assumed to be \$664. This was the average refund for all Federal returns for the years 1978-1981; (2) The average per capita disposable income in the year 2000 was assumed to be \$14,954 (1980 dollars), based on estimates in the 1980 OBERS projections (U.S. Department of Commerce 1981b); (3) The unemployment rate was assumed to be 4.5%, which is consistent with the OBERS methodology used to forecast income; (4) Public land was projected at 32% of the total land area in the United States in the year 2000. This is the current proportion of public land and is not expected to change significantly; (5) Donations by persons not receiving refunds would be possible. (Hence, the value of the variable OTR was set to 1.); and (6) There would be no upper limit on donations. (Hence, the value of UL in the forecasts was 0.)

The average contribution projection was used to forecast total revenue by multiplying the projected population in the year 2000 (\$267.4 million) by the average ratio of tax returns to population for the years 1978-1981 (0.415) by the average proportion of tax returns with refunds (0.7095). The forecasts of Federal revenue presented in Table B-19 were based on these assumptions and the assumption that State nongame checkoff programs in the year 2000 would have no impact on Federal checkoff revenues.

Competitive effects. The assumption that State checkoffs in the year 2000 would have no competitive effect on Federal revenue is somewhat unrealistic. A more realistic approach would be to forecast Federal and State checkoff revenues simultaneously, factoring in the likely competitive effects. However, no historical experience exists on which to base a hypothesis concerning the nature and significance of possible competitive effects. Nevertheless, careful consideration of this potential problem does allow the projection of a likely range of Federal revenue.

It is unlikely that the interaction with a State checkoff would result in a Federal checkoff revenue greater than the level forecast in isolation. Therefore, this figure can serve as an upper bound. Individuals contributing to the Federal checkoff may view the State checkoff in a manner analogous to an additional checkoff on the Federal tax form. Using the same values used in the forecast for the Federal tax in isolation, but setting the value of OCO to 1, yielded a forecast of Federal revenue of \$54.5 million in the year 2000. In a worst case scenario, Federal checkoff contributions might be reduced dollar for dollar by contributions to the State checkoffs. Subtracting the forecast of combined State revenue in isolation (\$24.12 million) from the forecast of Federal revenue in isolation (\$73.45 million) resulted in a forecast of Federal revenue of \$49.33 million in the year 2000.

The existence of a Federal checkoff could also be expected to have competitive effects on State checkoff revenues. Although no historical example exists that might allow a hypothesis on the nature and significance of these competitive effects, a projection of the likely range of State revenues, under competitive conditions, is possible. Combined State revenue in the year 2000 was forecasted, using the model presented previously, at \$24.12 million,

assuming no interactive effects (Table B-20) (Harpman 1984). A Federal check-off is not likely to result in combined State revenues greater than the level forecast in isolation. Therefore, this figure can serve as an upper bound. Alternatively, individuals contributing to their State checkoff may view the Federal checkoff in a manner analogous to an additional checkoff on their State tax form. Using the appropriate State variable values, but setting the value of OCO to 2, yielded a forecast of combined State revenue of \$5.1 million. In a worst-case situation, combined State checkoff revenue might be reduced dollar for dollar by contributions to the Federal income tax checkoff. Subtracting the forecast of Federal revenue in isolation (\$73.45 million) from the forecast of combined State revenue in isolation (\$24.12 million) resulted in a negative forecast of combined State revenue. This was reported as 0 in Table B-20.

Table B-20. Range of combined potential State checkoff revenue in the year 2000 (millions of 1980 dollars).

24.1	(no competitive effects)
5.1	(Federal checkoff viewed as an additional checkoff on the State tax form)
0	(combined State revenues reduced dollar for dollar by the contributions to the Federal checkoff)

Federal and State checkoffs would involve separate tax returns and separate refunds; therefore, it seems likely that the most probable forecasts would be near the upper end of the ranges presented in Tables B-19 and B-20.

Dilution, the danger of checkoff proliferation. Dilution is a term that has been coined for the reduction in nongame checkoff revenue assumed to be the result of the addition of other checkoffs to the tax form. This model appears to confirm the existence of dilution, because of the significant and negative relationship between additional checkoffs and nongame checkoff revenues.

Nongame revenues are apparently very sensitive to the existence of other checkoffs. As illustrated in Table B-19, the addition of one more checkoff to the tax form is predicted to reduce total Federal checkoff revenue by approximately 26%. It seems likely that the revenue generated by a nongame checkoff will decline drastically if checkoffs are allowed to proliferate on the tax form.



## Economic Efficiency

The checkoff would not result in excess burden because it does not distort the market price of any economic activity.

Public goods are goods that are nonrival in consumption and for which exclusion of consumers is not feasible. Nongame wildlife is partially a public good. Once this good is provided, individuals cannot readily be excluded from receiving the benefits. The good is often nonrival because one individual's "consumption" of the nongame resource will not, barring congestion costs, affect the "consumption" benefits of other users.

Because no one can be excluded from enjoying the benefits of a public good, an individual has a strong incentive to be a "free rider"; i.e., to enjoy the benefits provided without sharing the costs. This free rider behavior is the reason that governments use compulsory funding mechanisms to supply the optimal level of any public good (e.g., National defense).

The voluntary nature of the income tax checkoff makes "free riding" easy and without social stigma. It seems likely that such behavior would be widespread, resulting in suboptimal funding for nongame programs. Therefore, the use of a checkoff as the sole funding mechanism for nongame programs would not result in efficiency nor be consistent with the notion of benefits received.

Competitive interaction effects. The adoption of a Federal checkoff might well result in competitive interaction effects on the revenues at both the State and Federal levels, although no historical evidence exists to indicate what the size of the impact might be. Even if the impact were substantial, however, economic analysis on the basis of tax equity or efficiency criteria provides no guidance on the question of whether the checkoff should be utilized at both levels of government or at only one level.

## Benefits Received

Contributors to the nongame checkoff receive benefits at least equal to their contributions. It does not follow, however, that their contributions necessarily are proportional to the benefits they receive. People have an incentive to donate less than their full benefits. Although benefits received are difficult to measure in the case of nongame wildlife, the equity question can still be addressed conceptually, at least, using the benefits received principle. Because the checkoff is voluntary, two individuals receiving equal benefits may not be bearing an equal share of the cost. In fact, it is quite likely that any relationship between benefits received and contributions is very weak because of free rider behavior.

## Ability to Pay

The results of taxpayer opinion surveys in Iowa and New Jersey suggest that individuals with higher incomes were more likely to donate to the nongame checkoff than individuals with lower incomes (IMR/Opinion Research 1983; Applegate 1984). In general, persons with a greater ability to pay are

absorbing more of the burden of providing this public good. Furthermore, taxpayers who make a contribution must consider themselves able to pay and choose a contribution level based on this perceived ability.

When the checkoff mechanism is examined more closely, however, several facts that might indicate a violation of the ability to pay principle become apparent. For example, persons of equal ability to pay may not contribute the same amount and, therefore, do not share equally in the cost. In this sense, the nongame checkoff cannot be said to be horizontally equitable.

In respect to vertical equity, the net cost of each dollar contributed is less for a high-income taxpayer than for a low-income taxpayer because of the graduated income tax rates and the fact that checkoff contributions are deductible the following year. For a taxpayer in the 20% tax bracket, each dollar contributed has a net cost of \$0.80. In effect, the other \$0.20 is shifted to other persons who must pay higher rates on taxable income to maintain a given amount of total revenue. A taxpayer in the 50% tax bracket has a net cost of only \$0.50 for each dollar contributed. Thus, even if contributions increased with income, the net burden borne by higher income contributors would be less than that of low-income contributors unless contributions increased faster than net cost decreased. Furthermore, the results of a study of Idaho State income tax returns indicated that while checkoff contributions increased with income, the rate of increase in contributions was slower than the rate of increase in income (Harpman 1984). Thus, contributions are distributed regressively with respect to income.

M. SALE OF SEMIPOSTAL STAMPS FOR NONGAME, WITH THE CONTRIBUTION BEING 25 TO 50% OF THE POSTAGE VALUE OF THE STAMP

Product/Source Definition

Semipostal stamps are special stamps that bear a surtax in excess of the regular postage fee. For example, a customer pays \$0.30 for a stamp that can only be used to cover a \$0.20 postal fee. The surtax is usually printed separately on the stamp.

Funding Potential

Semipostal stamps have never been sold in the United States. However, they have been issued in Europe and Canada, with the surtax dedicated to charities or other specific purposes. Some data on foreign stamp sales were obtained and reviewed. A demand equation could not be estimated because of the lack of historical data on sales of semipostal stamps in the United States.

Limited data on semipostal stamps were obtained through the Department of State from Belgium, France, Germany, Great Britain, and Switzerland. Additional data were obtained through personal communication from Canada. The surtax on semipostal stamps has been dedicated to a variety of purposes, including independent welfare agencies and groups, youth programs, Olympic sports, pilot training, Red Cross, charities for handicapped persons, charitable foundations for children and large families, maintaining and restoring

buildings and monuments of National importance, programs for persons with visual and oral handicaps, African conservation, and general funds. Surtaxes have ranged from 20 to 100% of the postage value of the stamp, with most of the issues carrying a 50% surtax.

A rough estimate of revenue potential was developed from the foreign sales data. Switzerland has been selling "special stamp issues with surcharge" for over 70 years. Although the data obtained for Switzerland were for only 4 years (1977 to 1980), these data were used, along with data from Germany, to estimate potential revenue from a surcharge for nongame postage stamps in the United States.

The Swiss Postal Administration has been issuing special stamps, which are printed twice a year, since 1912. The surcharge is between 43 and 50% of the face value of the stamp. Ninety percent of the revenue from the surcharge is transmitted by the Postal Administration to a charitable private foundation supporting children's homes and providing financial assistance to large, poor families and for maintaining and restoring buildings and monuments of National importance. A commission established by the Swiss Government determines the other charitable institutions that benefit from the remaining 10% of the revenues collected.

German semipostal stamps have been sold for a variety of purposes, including Olympic sports and independent welfare groups. Generally, issues have been released in series of four with surtaxes always at 50% of the face value. The number of semipostal stamps sold from 1977 to 1980 ranged from 38.7 to 63.2 million and averaged 52.6 million. Annual per capita sales during this period were approximately one semipostal stamp. Sales in Switzerland have averaged 56.7 million (range of 54.7 to 59.3 million), with per capita sales of nine stamps. However, these numbers may include significant stamp sales to individuals in other countries.

Assuming the same per capita sales in the United States as in Germany and Switzerland, approximately 226 to 2,034 million stamps would have been sold, given a 1980 population of 226 million. If \$0.20 stamps were sold with a \$0.10 surcharge (50%), potential revenues from the surcharge would have been \$22.6 to \$204.3 million. A \$0.05 surcharge would have yielded \$11.3 to \$101.7 million. Some additional cost above normal stamp production would be incurred for advertising the semipostal issues. Therefore, net revenues would be less than the previous estimates. Estimated potential gross revenue in the year 2000, based on projected population increases, would be \$26.7 million (one stamp per capita) to \$240.3 million (nine stamps per capita).

These potential revenue estimates generally assume that only one or very few programs obtain funds from semipostal stamps. Competition for sales for purposes other than State wildlife programs could significantly reduce the potential revenue estimated above.

### Economic Efficiency

The economic efficiency effects of the surcharge would be limited because the purchase of semipostal stamps is voluntary. Also, stamps are usually purchased in small quantities, and stamp buyers would have a choice between semipostal stamps and regular stamps. Every citizen buying stamps would then have the opportunity to make a small contribution to nongame wildlife. Some reduction in postal revenues might occur because collectors probably would not increase their expenditures for stamps and individuals might purchase fewer stamps overall. However, most funds to purchase semipostal stamps probably would come from discretionary income. On the average, this would be \$0.10 to \$0.90 per capita per year, based on the limited available data.

### Benefits Received

Purchases could be in line with an individual's own perceived benefits because the purchase of semipostal stamps would be voluntary. Incentives exist for free rider behavior; therefore, benefits received by some from wildlife management would be financed by others. Alternatively, purchases might be made up to the point where the perceived benefits, in terms of viewing, photography, or existence values, equaled the cost. In Switzerland, people buy semipostal stamps because the stamps are well designed and attractive and customers want to support the institutions that benefit from the surcharge. However, some purchases would be by collectors to keep their collections current. In Germany, 80 to 90% of all semipostal stamps are purchased by collectors.

### Ability to Pay

This program would be voluntary in terms of time and quantity of purchases. Therefore, it is reasonable to assume that purchases would be in line with a purchaser's view of his or her ability to pay, with respect to income.

## N. EXCISE TAX OF 5 TO 10% ON RECREATIONAL DIVING EQUIPMENT LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

### Product/Source Definition

This potential source includes masks, snorkels, tanks and attachments, flippers, wetsuits, and spearguns used in recreational diving activities.

### Funding Potential

Estimates of the retail sales value of recreational diving equipment for 1972-83 (except for 1977-1978) were obtained from National Sporting Goods Association marketing surveys and file data (Kasen pers. comm.). Data on the quantities of these products sold were unavailable.

The value of manufacturers' shipments of underwater sports equipment, excluding clothing, watches, and cameras, were obtained for 1972 and 1977

(Valdez pers. comm.). These data, along with the data from the National Sporting Goods Association, were used to evaluate potential revenue from an excise tax on recreational diving equipment.

The 7 years of data on retail sales showed a pattern of nearly level nominal sales over this period. In real or constant dollars, however, sales have fallen. Annual sales fluctuated from \$58 to \$72 million; estimated sales for 1982 and 1983 were \$67 to \$72 million, respectively. The average over the 7-year period was \$66 million. Because nominal sales fluctuated very little over this period of time, the average retail sales figure of \$66 million was used to estimate potential tax revenues in 1980 (in 1980 dollars) at the manufacturer and importer level. The U.S. Department of Commerce estimated margin of 0.579 (Horowitz pers. comm.) resulted in an estimated \$38 million in manufacturer/importer prices.

A 5% tax would amount to \$1.7 million of revenue annually, based on gross and net sales of \$36 and \$34.3 million, respectively. The likely high price elasticity (see Economic Efficiency section) with a 5% excise tax would result in as much as a 10% decrease in sales. A 10% excise tax could result in as much as a 20% decrease in sales, leaving gross sales, net sales, and tax revenues at \$34.2 million, \$31.1 million, and \$3.1 million, respectively. Sales in constant or real dollars have fallen substantially during the 10 years covered by the available data. Negligible revenue can be expected in the year 2000 if current trends continue.

Recreational diving equipment includes masks, snorkels, tanks, regulators, flippers, wetsuits, and spear guns. These products are included in the Tariff Schedules of the United States as item 735.15 Underwater breathing devices designed as a complete unit to be carried on the person and not requiring attendants; item 735.20 Sporting goods not specially provided for; and 708.45 Eyeglasses, lorgnettes, goggles, and similar articles and parts, frames, and mountings (U.S. International Trade Commission 1981a). In 1980, duties on articles imported from developed countries were 3.8% under item 735.15, 9.5% for articles under 735.20, and 14% for items in 708.45. By 1987, articles under item 730.15 are scheduled to be duty free, item 735.20 will have a duty rate of 5.8%, and articles imported under item 708.45 will be charged a duty of 7.2%. In 1980, \$802,000 of articles under item 735.15 were imported (Watkins pers. comm.), yielding \$31,278 in tariff revenue. Potential 5 to 10% taxes would yield estimated additional revenue of \$38,000 to \$70,000, based on elasticities estimated below. These tariff collections would decrease to zero by the year 2000, based on declining real purchases and reduced duty rates in future years. However, imports of self-contained diving units, item 735.15, have increased dramatically during the past 15 years, increasing from \$177,000 in 1968 to \$1,531,000 in 1983. Continuation of this trend would yield increased import revenues by the year 2000 except that these products, imported under item 730.15, are scheduled to become duty free by 1987. Data were not available to evaluate potential revenue from other recreational diving products imported under items 735.20 and 708.45 (Doyle pers. comm.; Gray pers. comm; Watkins pers. comm.).

## Economic Efficiency

Data on price sensitivities (elasticities) or data that could be used to statistically estimate elasticities were not available, and only a qualitative evaluation of economic efficiency is provided. Recreational diving equipment can be divided into two general categories. The first category contains relatively inexpensive items, such as flippers, masks, and snorkels, which can be used for underwater diving or snorkeling. The second category includes complete underwater recreational diving sets, with an average cost of \$1,000 to \$2,000 (Pacific Northwest Magazine 1983).

A large price sensitivity for snorkeling equipment is not expected. Although these items are not necessities, their relatively low price suggests a price elasticity around 2. Houthakker and Taylor (1970) reported a long term price elasticity of 2.3389 for all sporting goods equipment. The price elasticity of relatively lower priced snorkeling equipment would probably be slightly less. Therefore, a 5% excise tax could result in as much as a 10% decrease in the demand for these items. In this case, the percentage of excess burden or economic efficiency loss would be slightly above average, but not unusually large; \$0.05 to \$0.06 per dollar of tax revenue might be lost.

The more expensive diving tanks and wetsuits likely would be fairly price sensitive. These items can be considered luxuries, and the "income effect" of a 5 or 10% tax could be significant. For example, a 5% excise tax could reduce the quantity demanded by up to 15%. Both consumers and producers would share the burden, because it is likely that there are some specialized factors of production that would not be reemployed at their current wage in other industries. An equal percentage tax on both domestic and imported diving gear would represent a larger absolute tax on the higher priced domestic diving gear than on imported items. However, a constant percentage tax would not change the relative prices between domestic and imported diving gear. The difference, in absolute terms, would have an effect on sales only through the income effect, which could be significant for the expensive items.

The overall effect of an excise tax on economic efficiency would depend on the percentage of total expenditures for expensive tanks and suits versus expenditures for inexpensive items, such as snorkels, masks, and fins. Both groups of items are certainly somewhat price elastic and possibly very price elastic, and it is likely that the effect of a 10% tax on economic efficiency would be significant. The percentage of excess burden of a 10% tax would be 15 to 20% or \$0.15 to \$0.20 of economic loss for each dollar of tax revenue raised if the price elasticity was 2.5 and 3.0, respectively. A 5% tax would have a distortion to economic efficiency closer to \$0.08 to \$0.09 per dollar of tax revenue.

## Benefits Received

Boggis and Hamilton (in press) indicated that about 11% of all projects funded by nongame checkoff monies in the 31 States with a checkoff went toward the conservation and management of aquatic wildlife. Some of the very limited current nongame funds go to provide public access to areas that might be used

for diving. An increase in funding for coastal States or States with large water bodies, made possible by excise tax revenue, would allow more emphasis on aquatic conservation.

A tax on items such as snorkels, masks, and flippers may be in line with the added benefits that purchasers receive resulting from expenditures of tax funds on habitat improvement. However, a 5 or 10% tax on tanks or wet suits would not provide added benefits to the payer that were in line with the absolute amount of the tax.

Primary indirect benefits of the expenditure of potential excise tax funds from recreational diving equipment are improvements in water quality and fish populations, which would enhance recreational diving experiences. The benefits received linkage is positive, although data were unavailable for quantifying the degree.

#### Ability to Pay

Data were not available to evaluate how expenditures on recreational diving equipment varied with income. With an excise tax that is a constant percentage of the price, a disproportionate share of the potential tax would be paid by individuals buying diving tanks and wet suits. These persons would likely be in the middle and upper income classes. An excise tax on the lower priced items would be mildly regressive because increases in expenditures may not keep pace with increases in income. It is likely that the participation rate in snorkeling (i.e., the decision whether or not to buy equipment) rises with income; therefore, the tax should be mildly regressive. Data were unavailable for the calculation of a Suits Index.

#### O. EXCISE TAX OF 1 TO 5% ON PHOTOGRAPHIC EQUIPMENT AND FILM LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

##### Product/Source Definition

Still cameras considered in this analysis included:

Twin-lens reflex cameras. These cameras have two lenses, one that obtains the photographic image and the other for viewing. These cameras are box-shaped with a horizontal ground glass screen on top of the camera.

Single-lens reflex cameras. These cameras have a single lens that is used both for viewing and taking photographs, enabling the photographer to view the exact image being photographed. Most single-lens reflex cameras can be fitted with interchangeable lenses and electronic flash units, and some are equipped with electric motors that advance the film after each exposure.

Instamatic cameras. These cameras feature a simple drop-in 126 or 110 cartridge film. The 126 cartridge contains film that is 35 mm wide; the 110 cartridge film is 16 mm wide. The cartridge loading capability makes these

cameras easy to use. Instamatic cameras range from the very simple fixed-focus instrument to the more complex variable focus cameras with automatic exposure control systems, electronic shutters, and built-in electronic flash units.

Instant-print cameras. These cameras deliver a finished print shortly after exposure. The film carries its own developing chemicals in pods that are crushed by rollers and released over the film.

Lens-shutter cameras. This is the more traditional type of instrument; however, the increasing appeal of new, relatively low priced, 35 mm lens-shutter cameras has resulted in a resurgence in sales of these cameras (ABC Leisure Magazines, Inc. 1983).

Commercial, industrial, and scientific still cameras are excluded from this potential source, except when sold as consumer models, as identified above. The cameras included in this potential excise tax typically are marketed through distribution channels such as discount stores, specialty camera stores, department stores, drug stores, and catalog showrooms. Specialty camera stores offer the consumer a complete line of photographic cameras, backed by product servicing and expertise (U.S. International Trade Commission 1981b). The estimates, developed below, for still film, lenses, filters, and tripods also reflect sales to the amateur market. Dental, medical, and industrial film were excluded from this potential funding source.

#### Funding Potential

Data on the unit sales and dollar volume of still film to amateurs from 1973-81 were obtained from the 1981-82 PTN Photographic Industry Market Review (Watson pers. comm.). Estimates for unit sales for 1982 were based on a correlation with the number of still pictures taken yearly by amateurs from 1967-82 (ABC Leisure Magazine, Inc. 1983). The unit price for 1982 was calculated based on unit prices calculated from the 1973-81 unit sales and dollar volume data, above, and extended to the year 1982 by a correlation with the photographic supplies wholesale price index for 1967-82. The estimated unit price for 1982 was multiplied by the estimated units sold to estimate the dollar volume for 1982.

The value at the manufacturers/importers price to retailers and shipments of 35 mm cameras from 1963-82 were obtained from the Wolfman Report (ABC Leisure Magazine, Inc. 1983). These more expensive cameras represented the bulk (145 models) of sales to amateurs; e.g., the sales volume of 35 mm cameras in 1982 was nearly twice the combined retail sales volume of instant and 110 cameras. Historical sales data, including units and value sold annually for Instamatic and other cameras, were not available. Thus, demand equations for these products were not estimated.

The dollar volume of lenses, filters, and tripods sold to amateurs were estimated based on data in the PTN Photographic Industry Market Review (1979). The value of Instamatic and instant-print cameras was estimated based on total still camera purchases (U.S. International Trade Association 1981b) minus still cameras purchased for professional use. The value of still cameras



purchased by amateurs was estimated based on data in the PTN Photographic Industry Market Review (1979). In summary, the data development process yielded data for:

1. all still film sold to amateurs;
2. all still cameras sold to amateurs;
3. all 35 mm cameras. These cameras included sales to professionals through retail outlets also selling to amateurs; and
4. all lenses, filters, and tripods sold to amateurs.

Estimation of the demand curve for 35 mm cameras utilized ordinary least squares regression analysis, instead of two stage least squares, because 82% of 35 mm cameras are imported. Thus, the U.S. acts as a price taker in the 35 mm camera market, influencing, but not determining, the price. The supply conditions are those of foreign countries and not the U.S. and were not analyzed for 35 mm cameras. The demand curve for 35 mm cameras at the importer or manufacturer level is:

$$Q_C = -7.437 - 0.02469P_C + 0.00001886TOTINC - 0.386TREND$$

T	(-2.55)**	(-7.85)***	(3.308)***	(-2.461)**
Values				

$$R^2 = 0.94$$

$$F = 80.53***$$

where  $Q_C$  = quantity of cameras in millions

$P_C$  = manufacturers or imported price of camera in 1972 dollars

TOTINC = total disposable personal income in 1972 dollars

TREND = a variable coded 1,2...19, representing other trends affecting purchase of 35 mm cameras

\*\* = significant at the 95% level

\*\*\* = significant at the 99% level

This equation is quite significant overall, as indicated by the large F values, and the price and income coefficients also are highly significant. The value of the Durbin-Watson statistic for autocorrelation is in the uncertain region.

The demand equation for film sales to amateur photographers was estimated using two stage least squares analysis, with correction for autocorrelation. Two stage least squares was used because a majority of film consumed is produced domestically.

The demand equation for film is:

$$\begin{array}{rcccl} \text{FQCAP} & = & -75.82765 & - & 1.18819P_F + 0.030181\text{INC} \\ T_{\text{statistics}} & & (2.95)^{**} & & (-1.085) \quad (8.75)^{***} \\ & & & & R^2 = 0.98 \quad DW = 2.02 \\ & & n = 10 & & F = 312.35^{***} \end{array}$$

where FQCAP = quantity of pictures or frames per capita

$P_F$  = real price (in cents) per frame in 1972 dollars

INC = per capita disposable income in 1972 dollars

\*\* = statistically significant at the 95% level

\*\*\* = statistically significant at the 99% level

The overall equation is significant at the 99% level. However, the coefficient on price was significant only at the 80% level. Income exhibited some multicollinearity with price. The equation did a good job predicting the quantity of film consumed in 1980. The Durbin-Watson statistic for autocorrelation was 2.02, indicating the absence of autocorrelation. No statistically significant supply curve was obtained, even though industry-specific data on wages and production costs were used.

The overall sales and revenue forecasts were estimated based on the sales and revenue forecasts for cameras and film sold to amateurs. The equation for 35 mm cameras was expanded to cover all still cameras sold to amateurs, based on data in the U.S. International Trade Commission Report (1981b) and the PTN Photographic Industry Market Review (1979). Revenue estimates were added for lenses, filters, and tripods sold to amateurs, based on data in the PTN Photographic Industry Market Review (1979).

The 1980 base revenue figures for all products other than 35 mm cameras were not dependent on the demand equation. However, the demand equation was needed to assess how unit sales and revenue would change with a 1 and 5% tax, as well as to forecast revenues for the year 2000. The response of quantity demanded for 35 mm cameras was assumed for all cameras, special lenses, and other photographic equipment. This assumption was, at best, only a reasonable approximation for "other photographic" equipment and non-35 mm cameras. Sales and revenue estimates for cameras, film, and other photographic equipment are shown in Tables B-21 to B-23.

Table B-21. Estimated potential annual sales of, and tax revenue from, cameras and other photographic equipment (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	1,154.0	1,154.0	0	5,454.0	5,454.0	0
1%	1,155.5	1,144.0	11.5	5,501.2	5,446.7	54.5
5%	1,172.0	1,116.0	56.0	5,690.4	5,419.4	271.0

Table B-22. Estimated potential annual sales of, and tax revenue from, film (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	1,377.0	1,377.0	0	4,840.0	4,840.0	0
1%	1,388.5	1,375.6	13.7	4,885.0	4,837.0	48.4
5%	1,434.0	1,366.0	68.0	5,068.3	4,827.0	241.3

Table B-23. Estimated potential annual sales of, and tax revenue from, still cameras, other photographic equipment, and film (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	2,531.0	2,531.0	0	10,294.0	10,294.0	0
1%	2,544.0	2,519.6	25.2	10,386.5	10,283.7	102.8
5%	2,606.0	2,482.0	124.0	10,758.7	10,246.4	512.3

Imports of still cameras and film, as well as lenses, filters, and tripods are discussed below. Potential duties from 1 and 5% taxes on these imports are included in the potential tax revenue.

Still cameras are classified under several Tariff Schedules of the United States item numbers. The estimated value of imports, rate of duty, and estimated duty in 1980 for these items are shown in Table B-24. The 1987 rate of duty scheduled as a result of the Tokyo round of Multilateral Trade Negotiations (U.S. International Trade Commission 1981b) also is shown.

The estimated duty of \$29.8 million was 7.0%, overall, of the estimated imports of \$425.3 million. The 7% duty rate will decrease to about 3%, overall, by 1987, assuming the relative level of imports under each item does not change significantly and the rates are not changed.

Still picture film is classified as Tariff Schedules of the United States item 723.15 which includes cartridges or rolls produced in various widths and lengths and used primarily by amateurs. The rate of duty for item 723.15 was 4.8% in 1980, with scheduled decreases to 3.7% in 1987.

In 1980, black and white and color imports, including cartridges, instant pack, and roll film, were \$55.4 million, which was 16.1% of total still film imports. Most of the still film imports were x-ray film, at \$140.8 million or 40.9% of total still film imports. Multiplying the film imports of \$55.4 million by the 4.8% duty rate yielded an estimated duty of \$2.7 million under the existing duty rate.

Table B-24. Still camera imports.

Item	Description	Value (000) <sup>a</sup>	Rate of duty <sup>b</sup> (%)	Estimated duty (000)	1987 rate of duty (%)
722.12	Fixed focus cameras	\$18,834	9.3	\$ 1,752	4.0
722.14	Other than fixed focus cameras valued \$10 or less	176	15.7	28	6.8
722.16	Other than fixed focus cameras valued over \$10 each	53,768	6.9	3,710	3.0
722.1625	35 mm cameras	352,524	6.9	24,324	3.0
Total		\$425,302		\$29,814	

<sup>a</sup>Excluding duty free imports. Estimated by subtracting duty free imports reported in Photographic Cameras (U.S. International Trade Commission 1981b) from still camera imports, other than microfilm, in the Wolfman Report (ABC Leisure Magazine, Inc. 1983).

<sup>b</sup>U.S. International Trade Commission (1981b).

Imports of photographic lenses and filters are classified in the Tariff Schedules of the United States under the items indicated in Table B-25.

Thus, estimated revenues of about \$20.4 million were collected in 1980 from other photographic products, excluding tripods for which data were not available. The estimated revenue of \$20.4 million would be reduced if there were significant quantities of duty free imports of these items in 1980 or if the dutiable value were lower for other reasons. The effective rates scheduled for 1987 will be reduced to less than half of the 1980 rates, assuming no significant changes occur in the relative import volume for each item.

Thus, the estimated revenue in 1980 from still cameras, film, and other selected photographic products under existing rates of duty was about \$52.9 million, based on the estimated \$29.8 million revenues from still cameras, \$2.7 million from film, and \$20.4 million from other photographic products, excluding tripods. The potential 1 to 5% taxes would add duty of \$6.7 to \$33.0 million. These added potential revenues are included in the total revenue estimated in Table B-23.

Table B-25. Imports of other photographic products.

Item	Description	1980			1987 rate of duty (%)
		Value (000) <sup>a</sup>	Rate of duty <sup>b</sup> (%)	Estimated duty (000)	
722.30A	Photographic lenses, mounted	\$165,046	11.6%	\$19,145	5.0
722.64A	Photographic filters	13,342	9.5	1,267	5.8
Totals		\$178,388		\$20,412	

<sup>a</sup>Values shown are from the Wolfman Report (ABC Leisure Magazines, Inc. 1983). These data may include duty free imports but data on these imports, if any, were not available.

<sup>b</sup>U.S. International Trade Commission (1981b).

The revenue from imports would increase by the year 2000, based on the estimated increasing gross sales. The increase in import duty would occur despite the scheduled future reductions in duty rates. This projection of increasing import duty assumed that the rate scheduled for 1987 would be unchanged in the year 2000.

#### Economic Efficiency

The demand for 35 mm cameras is fairly price insensitive or price inelastic. The price elasticity of demand in 1980 was 0.7. Because 35 mm cameras make up 76% of total sales volume of cameras, minimal economic efficiency losses should be associated with taxation of cameras. The excess burden of a 1% tax for 35 mm cameras would be 0.86%, less than \$0.01 of economic benefit lost for every dollar of tax revenue raised. This is a relatively small distortion. Even with a 5% tax, the excess burden would be only 1.68% of tax revenue, still a fairly small distortion per dollar of tax revenue gained (i.e., \$0.02 per \$1.00 of tax revenue).

It is difficult to apply these percentage of excess burden figures to all cameras, however. Given the lower price of Instamatic and disc cameras, the demand is expected to be more price inelastic than for 35 mm cameras (Hirshliefer 1976). If this is the case, the overall percentage of excess

burden may be smaller. The bulk of tax revenue would come from imported 35 mm cameras; therefore, foreign producers and domestic consumers would bear almost all of the tax burden.

The demand curve for amateur still film is very price inelastic, with an elasticity of 0.24 in 1980. A 1% charge in retail price would result in only a 0.24% decrease in quantity demanded. The resulting efficiency costs of a 5% excise tax would be very low, in relative terms. The percentage of excess burden of a 5% tax was estimated to be 0.36%, or \$245,856. A 1% excise tax would have minimal economic distortion, resulting in a 0.04% excess burden (\$5,122) or only about a \$0.04 loss in consumer satisfaction for each \$100 of tax revenue. This analysis assumed that consumers would bear the entire burden of a tax on film, which is consistent with traditional assumptions about excise tax shifting (Pechman and Okner 1974). It is certainly possible that domestic firms producing film would suffer some economic burden in the short term. Data were not available to determine the extent of this burden. Only production factors specialized to amateur film sales would suffer a reduction in earnings in the long term.

#### Benefits Received

Photographic equipment. Comparison of total consumer expenditures on cameras, special lenses, and other photographic equipment to expenditures on the same products by nonconsumptive wildlife users, as listed in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982), showed a reasonably strong benefits received linkage. Twenty percent of all expenditures for cameras and photo equipment were made primarily for nonconsumptive uses of wildlife. Therefore, 20% of the tax would be paid by persons using the photographic equipment primarily for wildlife purposes. This figure was somewhat higher than the percentage of people using cameras for wildlife purposes, because the expenditures (and tax) reflect the fact that most cameras used for wildlife photography are more expensive models, with expensive telephoto lenses.

According to data in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982), an additional 41% of expenditures on cameras and other photographic equipment was by consumers who stated that photographing wildlife was one of their intended uses. In total, about 61% of the expenditures on cameras, lenses, and other photographic equipment was used, at some time, for photographing wildlife. These overall figures indicate a fairly substantial benefits received linkage.

Film. Based on data in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982), it appears that 16% of all expenditures on film was primarily for photographing wildlife. No data were provided on the percent of film expenditures that had wildlife as a secondary use. A survey conducted by Newsweek Magazine (1982b) indicated that 67.4% of the purchasers of new 35 mm single-lens reflex cameras expected to take pictures of nature and that 47.2% expected to take pictures of wildlife.

With medical and industrial film excluded, the benefits received linkage was improved, but still was less than that for cameras. It was assumed that a majority of expenditures on still film were related to family pictures or travel, rather than to wildlife. However, the Newsweek survey indicated significant use of these cameras for wildlife photography.

#### Ability to Pay

Two sources of data were utilized to evaluate the distribution of a tax on cameras and selected photographic equipment by income and age. The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) listed expenditures by income class and age. Expenditures on cameras and photo equipment increased with age until the 35 to 44 age class and held stable until the over 55 age class. Expenditures for the 55 to 64 and above age classes were about 25% below average. The Bureau of Labor Statistics Consumer Expenditure Survey (U.S. Department of Labor 1978) indicated that expenditures on cameras and photo equipment change little in the 18 to 64 age range. However, the 65 year and older age range had expenditures about 30% below average. Both surveys supported the idea that older Americans would bear a below average amount of the tax burden on cameras and photographic equipment.

Both surveys indicated that the tax would be somewhat regressive. The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) indicated a large decrease in the percentage of income that would be paid as tax as income increased. The Bureau of Labor Statistics Consumer Expenditure Survey (U.S. Department of Labor 1978), showed a smaller decrease in the percentage of income paid as a potential tax. The Suits Index, based on these data, was -0.099, indicating a nearly proportional tax. The percentage of income devoted to paying the tax would be quite small, averaging less than 0.1% of income.

Data in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) was used to measure the impact of a tax on film by age and income class (Shaw 1983). The sample size was quite large, which increased confidence in these data. Expenditures rise steadily with age level, except for the 55 to 64 age class. Above average expenditures are made by persons in the 65+ age class. Expenditures rise with income up to the \$20,000 to \$25,000 income class. Above \$25,000, average expenditures alternate down and up until the highest income class. The \$50,000 income class has above average expenditures. Although expenditures tend to rise with income, the percentage of income devoted to paying the tax falls rather quickly as income rises. Thus, the tax on film would be considered fairly regressive.



P. ASSESSMENT OF CHARGES ON CERTAIN LOCATABLE MINERALS EXTRACTED FROM FEDERAL LANDS AND WATERS WHERE THOSE RIGHTS ARE CURRENTLY CONTROLLED BY THE FEDERAL GOVERNMENT

Product/Source Definition

Minerals can be categorized according to legislation enabling and regulating their discovery and development. In general, the Mining Law of 1872 applies to metallic mineral deposits (for example, copper and silver) and deposits of most nonmetallic minerals, such as fluorite. These minerals are generally referred to as "locatable" or "hardrock" minerals. The Mineral Leasing Acts of 1920 and 1947 generally apply to fuel minerals, except uranium, and to fertilizer and chemical minerals. These minerals are commonly called "leasable" minerals.

The Surface Resources Act of 1955 removed common varieties of sand, stone, gravel, pumice, pumicite, and cinders from "location" under the Mining Law of 1872 and made them disposable by the Secretary of Agriculture or the Secretary of the Interior, depending on jurisdiction. These minerals are referred to as "saleables." This potential funding source only includes locatable minerals.

Funding Potential

During the 19th century, free or almost free disposal of public domain to individuals and firms for mining, logging, farming, railroads, and other purposes was encouraged. The Mining Law of 1872 still authorizes any person to enter the public domain to explore for, and mine, valuable deposits of almost all nonfuel and nonfertilizer minerals. Rights are acquired by the discovery of a "valuable mineral deposit" and physical "location" (staking) of a mining claim. Claims can be located in any public domain land that has not been withdrawn from regulation by the Mining Law of 1872. Permission is not needed and notification to the Federal landowner is not required prior to locating a claim (Congress of the United States, Office of Technology Assessment 1979).

The Mining Law of 1872 authorizes the States to prescribe procedures for locating and recording claims, to specify annual work required to maintain claims and patents, and to impose environmental restrictions, usually limited to State reclamation requirements. Funding for these State programs usually is too limited to provide adequate environmental regulation and monitoring (Congress of the United States, Office of Technology Assessment 1979). Federal and State taxes may be imposed on these activities, as for any other business. State tax sources and revenue are listed in Stinson and Temple (1982).

Once claims are established, and particularly after they are patented, Federal land management agencies forfeit any agency jurisdiction or revenue potential. Moreover, claims are viewed as a "free" transfer of public resources to private individuals (Sheridan 1977). This is at variance with other uses of the public domain, such as grazing and cutting timber, where rights are not transferred and annual fees or stumpage charges are assessed.

Estimates of potential revenue from taxes of 1 to 5% on locatable minerals were impossible to make because production and value data for minerals extracted from the public domain are not available. This lack of data is related to the fact that claims are not viewed as Federal land and, before 1976, were not even registered with the Federal Government (Congress of the United States, Office of Technology Assessment 1979).

Stan Dempsey of Amax, Inc. estimated that the U.S. Government would collect about \$120 million annually if the production of locatable minerals on public domain lands were assessed a royalty equivalent to that charged for nonfuel minerals on acquired lands (Sheridan 1977). This figure was used as the upper estimate for 1980. It was extrapolated to \$141.2 million for the year 2000, based on anticipated population growth.

It is unlikely that a new tax could be assessed on the production of minerals that were once locatable, because of existing legal precedence and insufficient data. Therefore, initiation of a tax only on production from claims established after the effective date of a new tax was proposed as an alternative approach. Such a tax would have yielded \$0 in 1980. Projecting the revenue for the year 2000 was impossible because the historical production of minerals from public domain claims is unknown.

#### Annual Claim Renewal Fee

An annual claim renewal fee was considered as an alternative source of revenue. There were 1,206,678 unpatented claims of record at the end of fiscal year 1980 (U.S. Bureau of Land Management 1981). If each of these claimants had paid \$10 when filing the required annual affidavit of assessment work, \$12.1 million would have been collected. If \$25 were paid for each claim, \$30.2 million would have been collected. Total claims and estimated potential revenue in 1980 dollars was assumed to be the same in 2000 as in 1980.

No price elasticity of demand information was available to estimate how an annual claim renewal fee would affect the total number of claims. Significant reductions in registered claims might be expected, however, because the renewal fees of \$10 and \$25 would represent 10 and 25%, respectively, of the \$100 work a claimant must attest he or she has completed each year in order to maintain the claim.

To offset this reduction in claims and implied dampening of potential revenue, annual registration fees could be paid in lieu of the exploration/development work currently required by work affidavits. The claim holder would not incur higher annual costs and claims would not be reduced as much in number, but the expenditures of claimants would be shifted from mineral development activities to wildlife enhancement.

#### Economic Efficiency

A potential tax on mineral exploration and development would affect the likely incidence of tax and the pattern of resource use over time. Three

kinds of potential taxes on locatable minerals were considered utilizing a framework for analyzing the dynamic effects of taxes on exhaustible resource depletion described by Dasgupta and Heal (1979):

1. Sales tax. Only a fraction of a constant specific sales tax on locatable minerals would be absorbed by the owner of the resource, with the remainder passed on to consumers in the form of higher prices. The initial demand for minerals would be less than if no tax was implemented. If the sales tax increased exponentially at the competitive rate of interest, the pattern of extraction would not be affected. As the potential tax increased, the nontax element of the commodity price would decrease, the value of the deposit would be lower, and the consumer price schedule would remain the same. The entire tax would be absorbed by the resource owners and no potential distortion would occur unless mines closed.
2. Profits tax. This would be a "rent" tax because it would be applied to the "rent" or pure profits accruing to resource owners. If the tax rate on profits were held constant through time, the temporal allocation of the resource would be the same as it would have been without taxation, and the consumer price schedule would remain unaffected. The effect of the tax would be a reduction in the competitive value of the mineral deposit. This is the same result as expected with a specific sales tax that increased at a rate equal to the rate of interest. The effect would be different, however, if taxes were imposed on the interest earnings, as well as on the profits of mining companies. In that case, the tax would initially result in a higher consumer price, lower initial demand, and a lower rate of extraction.
3. Royalties. Royalties are taxes paid as a certain percentage of the value of resources extracted. They differ from profits taxes in that they are levied on gross sales revenue, rather than on pure profits. Royalties would be an addition to extraction costs because they are based on sales revenue. Their probable effect on resource use patterns are the same as those of a constant percentage sales tax. The potential tax would result in higher initial consumer prices and, consequently, greater conservation of resources. From the point of view of the mining firm, the taxable revenues produced by a one-unit depletion in extraction would equal the sales price received for the product. The tax liability incurred as a result would be proportionate to this price. However, these sales prices include positive extraction costs, which do not yield future capital gains. On the other hand, net returns (sales price minus costs) increase over time, presumably at the rate of interest. Because sales prices rise more slowly than the rate of interest, the present value of the sales price falls over time, as would the present value of the potential tax liability resulting from mineral extraction. Therefore, minimizing its potential tax liability becomes an incentive for a mining firm to postpone depletion.

The relevant question in considering these tax alternatives is not which tax would be free of distortion or bias, but rather "What is the best set of distortions to have if you must have them?" (Dasgupta and Heal 1979). In that context, not all taxes result in losses in allocative efficiency. Under certain circumstances, they can be used to tax away pure rent without distortion or even as a method to correct for distortions caused by existing tax structures, externalities, or other market imperfections. For example, in the absence of taxes or other charges, the current pace of mineral exploration and extraction may be too rapid because of environmental externalities (Herfindahl and Kneese 1974).

#### Benefits Received

The mining industry would receive no direct benefits from tax revenues used to enhance wildlife. Individuals within the mining industry would share in social benefits in the same way as the general public. About half of the U.S. population 16 years and older participate in some form of nonconsumptive wildlife enjoyment, and general benefits would accrue to a large part of the population (U.S. Department of the Interior and U.S. Department of Commerce 1982).

#### Ability to Pay

Table B-26 summarizes the effects of different taxes on patterns of use in an exhaustible resource extraction industry. The information in this table can be used to compare the resource allocation implications for each potential tax on minerals. In general, if the tax falls on resource owners (corporations or shareholders) the tax is likely to be progressive. If it falls on consumers it is more likely to be regressive.

Consumers. Use of processed locatable minerals is widespread in the manufacture of many durable consumer goods. However, it is difficult to estimate how prices for these goods would change if a tax were imposed on minerals and how various income groups would be differentially affected. These factors would vary significantly with the specific mineral considered and with the type of tax imposed. The ten industrial minerals sectors that included production of locatable minerals added \$1805.4 million to the value of National output in 1972. This was roughly 10% of the value added by all minerals and only about 0.15% of the total value added by all industrial sectors (U.S. Bureau of Mines 1981). These relatively low numbers suggest that taxes in the range of 1 to 5% would not have a significant effect on the price of commodities in the aggregate.

Mining corporations. The type of potential tax imposed on locatable minerals would influence the effect of the tax on mining corporations. Companies might shift all or part of the tax to purchasers or have the value of their deposits change over time, depending on the type of tax selected. The implications of various taxes on firms and their ability to pay the taxes also depends on their relative position in the industry, the geological conditions (e.g., grade of ore) in their deposits (Conrad 1980), the organizational structure (degree of competition) in their particular industry, and, even more broadly, the competitiveness of their domestic industry in world markets.

Table B-26. Effects of taxes on resource use patterns.

Type of tax	Intertemporal distortions	Corporate effects	Consumer effects
Sales tax			
Constant rate	Lower rate of extraction	Fraction of tax absorbed in lower value of deposits	Higher initial price to consumers
Exponentially rising rate	No distortion in rate of extraction	Full tax absorbed in lower value of deposits	Consumer price schedule unaffected
Profits tax			
On profits only	No distortion in rate of extraction	Full tax absorbed in lower value of deposits	Consumer price schedule unaffected
On profits plus interest income	Lower rate of extraction	Reduced value of deposits	Higher initial price to consumers
Royalties	Lower rate of extraction	Reduced value of deposits	Higher initial price to consumers

Q. EXCISE TAX OF 1 TO 5% ON TRAVEL TRAILERS AND CAMPERS, LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

Product/Source Definition

This potential funding source includes the following products:

Travel trailers. These are trailers pulled by cars, vans, or pick-up trucks that do not require special permits for highway travel. They are designed to serve as temporary living quarters "... for recreational, camping or travel use..." (Recreation Vehicle Industry Association 1983) and are not permanently hooked-up at a site. There are three types of travel trailers.

Conventional travel trailer. This is a "pull-type" trailer that ranges from 12 to 35 ft long and is towed from a bumper or frame hitch on the towing vehicle.

Park trailer. This unit is designed to serve as seasonal or temporary living quarters and ranges up to 40 ft by 8 ft. A park trailer can be set up by individuals without special skills and can be connected to utilities.

Fifth-wheel travel trailer. This unit is similar to a conventional travel trailer, except that it has a raised forward section that results in a bilevel floor plan and allows the unit to be towed by a pick-up truck equipped with a fifth-wheel hitch.

Two additional categories are:

Folding camping trailer. This is a "recreation camping unit" that is suitable for temporary living quarters. The collapsible sidewalls provide reduced air resistance during travel and improved visibility for the driver of the tow vehicle.

Truck camper. This "recreational camping unit" is loaded or mounted on a truck bed or chassis and provides "...temporary living quarters for recreational, camping or travel use" (Recreation Vehicle Industry Association 1983).

Self-propelled motorhomes and vans were excluded from this category. Motorhomes were evaluated as a separate category.

#### Funding Potential

Demand and price elasticity data for these products were not available. Therefore, raw data on price and quantity were used to analyze the price sensitivity of travel trailer demand to potential taxes.

The number and value of travel trailers, folding camping trailers, and truck campers sold at retail during 1970-82 were obtained from an industry association publication (Recreation Vehicle Industry Association 1983). Comparable data for 1967-70 were provided from Recreation Vehicle Industry Association files (Branner pers. comm.). The time series data for 1967 to 1982 on units shipped and deflated sales value (in 1972 dollars) were used to estimate a demand equation. Data were unavailable to estimate a statistically significant supply curve for truck campers and folding camping trailers. Two stage least squares analysis was used to estimate the following demand (and, where possible, supply) curves.

The demand and supply equations for travel trailers were:

$$Q_D = -104.7 - 0.070863 \text{ PTT} - 0.963 \text{ PGAS} + 0.000829 \text{ TOTINC}$$

$$T_{\text{Values}} \quad (1.502) \quad (-1.111) \quad (-5.587)^{***} \quad (2.32)^{**}$$

$$n = 16 \quad \quad \quad \text{DW} = 1.8999 \quad \quad \quad F = 10.8^{***}$$

$$\quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad R^2 = 0.66$$

$$Q_s = -375.09 + 0.172295PTT + 5.312 LCOST - 5.958 PPI$$

$$T_{Values} \quad (1.869)^* \quad (3.037)^{***} \quad (1.758)^* \quad (2.38)^{**}$$

$$n = 16$$

$$DW = 2.04$$

$$F = 2.59$$

$$R^2 = 0.39$$

where  $Q_D$  = Quantity demanded (in 1,000's)

PTT = Price of travel trailers in 1972 dollars

PGAS = Price index for gasoline

TOTINC = Total real disposable income in 1972 dollars

$Q_s$  = Quantity supplied (in 1,000's)

LCOST = Unit labor cost

PPI = Producer price index

\* = significant at the 90% level

\*\* = significant at the 95% level

\*\*\* = significant at the 99% level

The demand equation for folding camping trailers was:

$$Q_D = 290.28 - 0.110297 P_{FCT} - 0.1874 PGAS - 0.00003 TOTINC$$

$$T_{Values} \quad (2.70)^{***} \quad (-1.72) \quad (-2.596)^{**} \quad (-2.587)^{**}$$

$$n = 10$$

$$DW = 2.85$$

$$F = 44.91^{***}$$

$$R^2 = 0.957$$

where  $Q_D$  = Quantity demanded (in 1,000's)

$P_{FCT}$  = Price of folding camping trailers

\*\* = significant at the 95% level

\*\*\* = significant at the 99% level

The demand equation for truck campers was:

$$Q_D = 596 - 0.046593 P_{TC} - 0.3898 PGAS - 0.234 PCTRL - 0.0000198 TOTINC$$

T-Values (4.208)\*\*\* (-2.467)\*\* (-4.66)\*\*\* (-2.775)\*\* (-1.11)

n = 11

DW = 2.85 F value = 32.1\*\*\*  
R<sup>2</sup> = 0.95

where  $Q_D$  = Quantity demanded (in 1,000's)

$P_{TC}$  = Price of truck campers in 1972 dollars

PCTRL = Price of folding camping trailers

PGAS = Price index for gasoline

TOTINC = Total real disposable personal income

\*\* = significant at the 95% level

\*\*\* = significant at the 99% level

Based on the preceding equations, sales levels (at manufacturer prices), with and without 1 and 5% potential taxes, in 1980 and 2000 were estimated. These data took into account the change in quantity demanded due to increased price resulting from the tax. Tables B-27 to B-30 contain sales and revenue estimates. Estimates for 1980 were derived from the equation. These values may not perfectly match actual 1980 sales or units because the equation used in the analysis was the one that best fit the series of data, not the data for any one particular year. However, changes in potential revenue resulting from the tax were unaffected by any discrepancy.

Table B-27. Estimated potential annual sales of, and tax revenue from, travel trailers (thousands of units and millions of 1980 dollars).

Potential tax rate	1980				2000			
	Quantity	Gross sales	Net sales	Potential tax revenue	Quantity	Gross sales	Net sales	Potential tax revenue
0	61.8	434.8	434.8	0	225.6	1,924.0	1,924.0	0
1%	60.0	425.2	421.0	4.2	223.5	1,920.0	1,901.0	19.0
5%	52.3	381.6	363.4	18.2	214.7	1,900.5	1,810.0	90.5



Table B-28. Estimated potential annual sales of, and tax revenue from, folding camping trailers (thousands of units and millions of 1980 dollars).

Potential tax rate	1980				2000			
	Quantity	Gross sales	Net sales	Potential tax revenue	Quantity	Gross sales	Net sales	Potential tax revenue
0	33.2	71.6	71.6	0	2.7	5.9	5.9	0
1%	32.0	69.7	69.0	0.7	1.2	2.6	2.5	< 0.1
5%	27.2	61.5	58.6	2.9	-----negligible-----			

Table B-29. Estimated potential annual sales of, and tax revenue from, truck campers (thousands of units and millions of 1980 dollars).

Potential tax rate	1980				2000			
	Quantity	Gross sales	Net sales	Potential tax revenue	Quantity	Gross sales	Net sales	Potential tax revenue
0	17.6	46.0	46.0	0	-----negligible-----			
1%	17.0	44.8	44.4	0.4	-----negligible-----			
5%	14.5	39.8	38.0	1.9	-----negligible-----			

Table B-30. Estimated potential annual sales of, and tax revenue from, travel trailers, folding camping trailers, and truck campers (thousands of units and millions of 1980 dollars).

Potential tax rate	1980				2000			
	Quantity	Gross sales	Net sales	Potential tax revenue	Quantity	Gross sales	Net sales	Potential tax revenue
0	112.2	552.4	552.4	0	228.6	1,929.9	1,929.9	0
1%	109.0	539.7	534.4	5.3	224.7	1,922.6	1,903.5	19.1
5%	94.0	483.0	460.0	23.0	214.6	1,901.5	1,810.0	90.5

A small number of camping trailers and campers may be imported. However, records on imports of these products are not compiled by the Recreation Vehicle Industry Association because few of these units, if any, are imported (Branner pers. comm.). Data on imports of these products were not available from the Recreation Vehicle Dealers Association or the U.S. International Trade Commission (McElroy pers. comm.; Treadwell pers. comm.). The existing and potential tariff revenue from these products in 1980 and 2000 were not estimated due to the small number imported, if any, and lack of data on the quantity, value, and origin of these imports.

#### Economic Efficiency

The price elasticities of demand and supply for travel trailers in 1980 were -5.11 and 12.43, respectively. Given that demand is less price elastic than supply (although both are high), consumers would bear most of the burden of an excise tax as a price increase. Using formulas developed by Colberg (1976), it was determined that consumers would bear 75% of the tax burden, with producers bearing the remaining 25%. The excess burden of a potential 1% tax in 1980 dollars would be \$63,296. This represents 1.5% of the tax revenue or about \$0.02 per dollar of tax revenue. The excess burden, as a percent of the tax, would be relatively small, implying minimal distortion to economic efficiency from a 1% tax on travel trailers. These conclusions are tentative until better data becomes available that can be used to estimate the demand curve. A 5% excise tax at the manufacturers' level would have resulted in a nearly 20% estimated decrease in quantity demanded in 1980. The excess burden associated with a 5% tax is 9.1%, which is quite significant.

Given the strong positive income effect and the estimate of future income from the Bureau of Economic Analysis (U.S. Department of Commerce 1981b), the demand for travel trailers is expected to increase over time. A 1% tax at the

manufacturers' level would result in about a 1% decrease in sales in the year 2000, even if gasoline prices continued to rise as they have over the last 10 years. A 5% tax would decrease sales in the year 2000 by 5%.

The price elasticity of demand for folding camping trailers is -5.1, making the demand fairly price sensitive. The excess burden of a 1% excise tax (assuming the entire tax was passed through to the consumer) would be \$13,110. This represents 1.9% of the tax revenue collected and is about average. However, a 5% excise tax would significantly increase the percentage of excess burden to 11.0%. The 5% excise tax would appear to have a significant adverse effect on economic efficiency, when compared to a 1% excise tax.

The negative sign on income in the equation for folding travel trailers indicates a predicted decline in sales by the year 2000. It appears that some consumers will switch to travel trailers and motorhomes, because both of these goods have a positive income coefficient. Sales in the year 2000 could withstand a 1% excise tax if gasoline prices did not continue to rise. Continued real increases in gasoline prices would eliminate almost all of the sales of folding camping trailers by the year 2000.

The price elasticity for truck campers is 4.57. The excess burden with a 1% excise tax would be \$7,811 or 1.95% of the tax revenue. At this tax rate, the economic efficiency represents only about a \$0.02 loss per dollar of tax revenue. The equation for truck campers predicts negligible sales in the year 2000, resulting from a switch to travel trailers and motorhomes, regardless of whether or not truck campers are taxed. However, the large standard error on the income coefficient indicates that future sales cannot be estimated with great certainty.

A 5% excise tax on truck campers would result in a 10.6% excess burden. This indicates significant efficiency distortion. The percentage of excess burden associated with either a 1 or 5% excise tax may actually be less than indicated because manufacturers and resource suppliers may bear a portion of the tax.

### Benefits Received

There is a positive relationship between the payment of a tax on travel trailers, folding camping trailers, and campers and benefits to the taxpayers from nongame wildlife management. Travel trailers and folding camping trailers are used at least 90% of the time for recreational purposes (Curtin 1980). Slide-in campers are used about 80% of the time for recreational purposes. The average owner used their truck camper or travel trailer about 18 days per year and their folding camper trailer about 10 days per year.

Based on results of the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Shaw and Mangun (1984) determined that about 9% of the people who owned or bought travel trailers, tent trailers, or campers did so with the nonconsumptive use of wildlife as a primary purpose. An A. C. Nielson survey (1982) found that 39.1% of campers used a recreational vehicle and 44.6% used tents.

The benefits received linkages are influenced by the absolute amount of the tax paid relative to the tax-related benefits received by the consumer. A 1% excise tax on travel trailers may result in a one time tax payment of \$50 to \$70. This may be in line with the additional benefits of visiting outdoor areas with increased wildlife populations and diversity. This is particularly true when the tax payment is spread out over the lifetime of a trailer of, say, 10 years. However, a 5% excise tax on travel trailers would result in a tax payment of \$270 to \$350. This tax would be double or triple the tax paid by the purchaser of a camper or tent trailer, even though all buyers would receive about the same level of benefits from the expenditure of the tax revenue. Therefore, a 5% tax on travel trailers might create a differential between benefits received and tax paid.

Truck camper and folding camping trailer purchasers would pay about \$26 and \$11, respectively, at a 1% tax rate. This seems to be in line with the benefits accruing to these individuals associated with the expenditure of the tax revenues.

#### Ability to Pay

The average annual payment (or purchase) for campers or camper vans was \$3,700 in 1980, according to an analysis of data from the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (Shaw 1983). A 1 and 5% tax at the manufacturers' level translates into 0.1 and 0.5% of income. Expenditures are not closely related to household income. Expenditures rise with age until the 35 to 44 age bracket and then fall slightly until the 65 plus age bracket, when expenditures rise by a third (Shaw 1983).

A 1 and 5% tax on travel trailers would equal 0.4 and 1.4% of income, on the average. The Bureau of Labor Statistics Consumer Expenditure Survey (U.S. Department of Labor 1978) indicated that the level of expenditure on travel trailers and campers is fairly constant with increases in age and income. The \$50,000 and higher income group and the 55 to 64 age group have the highest expenditures. Although the small sample sizes in this survey limit confidence, the pattern of purchases indicated is quite similar to what was found in Curtin's (1980) survey for travel trailers and slide-in campers. Only folding camping trailers have an ownership rate that increases with income. The Suits Index for travel trailers and campers is -0.093, indicating slight regressiveness, bordering on proportionality.

#### R. EXCISE TAX OF 1 TO 5% ON MOTORHOMES, LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

##### Product/Source Definition

A motorhome is a "...recreational camping and travel vehicle..." (Recreation Vehicle Industry Association 1983) that is self-propelled and may contain a water supply and sewage storage. A kitchen, sleeping area, bathroom, and other facilities also may be provided. Motorhomes include the following types (Recreation Vehicle Industry Association 1983):

Conventional motorhome (Type A). This type of unit consists of living quarters constructed on a special chassis.

Van camper (Type B). A van camper consists of a panel-type truck converted by adding "... any two of the following conveniences: sleeping, kitchen, and toilet facilities, also 110 volt hook-up, fresh water storage, city water hook-up, and a top extension to provide more head room" (Recreation Vehicle Industry Association 1983:19).

Motorhome (Type C - mini). Motorhomes consist of an automotive-manufactured cab and frame, with a gross vehicle weight of 6500 lbs or more, on which the living area is constructed. Mini motorhomes are more than 8 ft tall.

Motorhome (Type C - low profile). This unit also has an automotive-manufactured cab and frame with a gross vehicle weight of 6500 lbs or more, but is less than 8 ft tall.

Motorhome (Type C - compact). This unit also has an automotive-manufactured cab and chassis but its gross vehicle weight is less than 6500 lbs. The compact motorhome may include any or all of the facilities found in the larger units.

#### Funding Potential

Demand and price elasticity data for these products were not available. Therefore, other data were used as the basis for analyzing the price-quantity relationship. Data on shipments and the retail values of these shipments for all types of motorhomes for the years 1970 to 1982 were obtained from an industry association publication (Recreation Vehicle Industry Association 1983). However, these values included van conversions from 1976-82. The number of van conversions for this period and the unit retail value of these conversions from 1980-82 were obtained from an industry association publication (Recreation Vehicle Industry Association 1983). The unit values of van conversions from 1976-79 were provided by the Recreation Vehicle Association (Branner pers. comm.). The total value of van conversions from 1976-82 was calculated by multiplying unit values by the number of units shipped and this total subtracted from the value of motorhome shipments, which included van conversions, to obtain an estimate of motorhome values for 1976-82. These values, combined with total motorhome values for 1970-75, which did not include conversions, were used with the data on shipments to calculate the unit value of motorhomes for 1970-82. The unit prices were correlated with the motor vehicle price index to estimate unit prices for 1965-69. This data development process resulted in information on unit sales, total retail value, and unit prices for 1965-82, with unit prices and total retail value estimated only for 1965-69. These data were converted to wholesale values, based on industry association data (Recreation Vehicle Industry Association 1983) and used to evaluate the price-quantity relationships for these products. No statistically significant demand equation could be estimated from these data. Therefore, a revenue forecasting equation, based on these data, was developed instead:

$$\text{Real sales} = -7295296 + 11.43427\text{TOTINC} - 10759.77\text{PGAS}$$

$$\text{TValues} \quad (-4.51)^{***} \quad (5.53)^{***} \quad (-6.99)^{***}$$

$$n = 11 \quad R^2 = 0.878 \quad F = 28.94^{***}$$

$$\text{DW} = 1.54$$

where Real sales = real sales of motorhomes in 1972 dollars

TOTINC = total real disposable personal income in 1972 dollars

PGAS = gasoline price index

\*\*\* = significant at the 99% level

The equation was corrected for autocorrelation, using the Cochrane-Orcutt procedure.

The overall equation was statistically significant at the 99% level. TOTINC and PGAS were set at their forecasted values for the year 2000, and the equation recalculated to estimate sales in the year 2000. Estimated revenues are shown in Table B-31.

Table B-31. Estimated potential annual sales of, and tax revenue from, motorhomes (millions of 1980 dollars).

Potential tax rate	1980			2000		
	Gross sales	Net sales	Potential tax revenue	Gross sales	Net sales	Potential tax revenue
0	482.0	482.0	0	930.0	930.0	0
1%	453.0 to 467.6	448.5 to 463.0	4.5 to 4.6	874.0 to 902.0	865.4 to 893.0	8.6 to 9.0
5%	337.0 to 409.5	321.0 to 390.0	16.0 to 19.5	651.0 to 790.0	620.0 to 752.4	31.0 to 37.6

Almost no motorhomes are imported. Thus, data on the number and value of imports are not compiled by the Recreation Vehicle Industry Association (Branner pers. comm.). Data on imports also were not available from the Recreation Vehicle Dealers Association or the U.S. International Trade Commission (McElroy pers. comm.; Treadwell pers. comm.).

Motorhomes would be imported principally from Canada. These imports would be duty free under the Automotive Products Trade Act of 1965 (McElroy pers. comm.). The existing and potential tariff revenue on motorhomes in 1980 and 2000 were not estimated due to the small number of these imports, the duty free status of any motorhomes imported from Canada, and the lack of data on the number, value, and origin of motorhome imports.

### Economic Efficiency

Based on the four factors that influence price elasticity, it appears that the demand would be very price elastic. The income effect of such a high priced item certainly would be large. However, there may be few good substitutes for motorhomes for many persons, particularly retirees. A price elasticity in the range of 4 to 7 was assumed in calculating potential tax revenue. This elasticity is similar in magnitude to that estimated for travel trailers. Therefore, a 1% tax is expected to decrease the quantity demanded by 4 to 7%.

It was assumed that the entire tax burden would be borne by consumers in the long run. This assumption is acceptable as long as the factors of production are not so highly specialized to the motorhome industry that they cannot be reemployed elsewhere in the motor vehicle industry at similar wage levels.

It is impossible to accurately quantify the excess burden associated with a 1 and 5% tax without quantitative information on price elasticity. Given the possibility of a price elasticity of 4 to 7, the percentage of excess burden potentially could be quite high, especially at the 5% tax rate. Assuming a price elasticity of 4, the excess burden was estimated to be nearly \$100,000 per year or about 2% of the tax revenue with a 1% tax in 1980. The excess burden with a 5% tax would be nearly \$2.5 million or 12% of the tax revenue, a \$0.12 loss of economic efficiency for every dollar of tax revenue. Therefore, a noticeable negative economic efficiency effect with a 5% excise tax is likely.

### Benefits Received

The benefits received linkage for motorhomes is positive. Curtin (1980) found that motorhomes were used for recreation 80% of the time, based either on the number of days in use or the number of vehicles. Shaw and Mangun (1984) reported that 8.3% of the people who owned or bought motorhomes in 1980 had nonconsumptive use of wildlife as their primary activity. Motorhomes were used about 18 to 28 days per year for recreation. A survey by A. C. Nielson (1982) found that 39.1% of all campers used a recreational vehicle. A quarter of all recreational vehicles are motorhomes, and many purchasers would benefit from expenditures of excise tax money on State acquisition of land where camping is allowed.

The benefits received by the taxpayer at the 1% excise tax level would likely be in line with the taxes paid. At the 5% excise tax level, a typical one time tax payment of \$800 would seem to be larger than the benefits received and inequitable, when compared to the tax paid on lower priced items. Motorhomes are a durable good lasting on average 10 years (Summers, pers. comm.).

Therefore, the annualized tax on motorhomes would be approximately \$80 per year. However, given the price differential, motorhome owners would pay four to five times as much as purchasers of truck campers or folding camping trailers.

#### Ability to Pay

The percentage of income devoted to paying a 1 and 5% excise tax would be 1.2 and 3.8%, respectively, in the year of purchase or 0.1 and 0.5%, respectively, when spread over the useful life of the product. The small sample sizes in the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) and the 1973 Bureau of Labor Statistics (U.S. Department of Labor 1978) Consumer Expenditure Survey allowed only a general evaluation of the pattern of expenditures relative to income. Expenditures appear to rise with income; the largest expenditures were in the two highest income categories in both surveys. Curtin (1980) reported that the ownership rate of motorhomes rose with income and that 44% of all motorhomes were owned by persons in the \$25,000 or greater income bracket (in 1980 dollars).

Expenditures were the highest in the 35 to 44, the 45 to 54, and the 55 to 64 age groups in both surveys. The 65 and over age group had relatively low expenditures on motorhomes, by comparison. Curtin (1980) found that the ownership rate of motorhomes peaked in the 55 to 64 age group and was only 1% in the 65 or older age group. Only 11% of motorhomes were bought by the 65 or older age group.



APPENDIX C. ANALYSES OF POTENTIAL FUNDING SOURCES THAT  
RECEIVED ONLY PRELIMINARY STUDY

Seven additional potential funding sources were evaluated initially in this study. Further consideration of these potential funding sources was discontinued by the Funding Recommendations Oversight Group after consideration and preliminary evaluation. These potential sources were:

- S. 5% excise tax on dog and cat foods, levied at the manufacturer/importer level.
- T. Tax or surcharge on Federal timber sales.
- U. Tax or fee on Federal firewood sales.
- V. 5 to 10% excise tax on wildlife art sales.
- W. 1 to 5% excise tax on downhill skis and equipment.
- X. 1 to 5% excise tax on cross country skis and equipment.
- Y. 1 to 5% excise tax on water skis, including bindings.

Data and information developed for each of these potential funding sources are presented in this appendix.

S. POTENTIAL 5% EXCISE TAX ON DOG AND CAT FOODS, LEVIED AT THE MANUFACTURER/  
IMPORTER LEVEL

Funding Potential

The Census of Manufactures reported product shipments of dog and cat food by companies of \$2.7 billion in 1977 (U.S. Department of Commerce 1980). Retail sales (in pounds) through U.S. retail food stores in 1980 increased 7.2% over 1977 sales (Pet Food Institute 1983). Therefore, estimated shipments in 1980 were \$2.9 billion in 1977 prices. Pet food prices in retail stores increased an estimated 23.3% from 1977 to 1980, based on data from the Pet Food Institute (1983). Therefore, estimated manufacturer sales for 1980 were about \$3.6 billion, at 1980 prices. A potential 5% tax on manufacturer sales would have yielded about \$179.6 million in gross revenue ( $0.05 \times \$3.6$  billion), unadjusted for any reduction in sales due to higher prices resulting from a tax. This estimate may be higher than the actual potential revenue because

the Census of Manufactures data on shipments in 1977 may have included transfers between plants within a company, which would not be subject to taxation. Two other assumptions relate to this revenue estimate:

1. The 23.3% increase in price between 1977 and 1980 reported for dog and cat food sold in retail food stores was assumed to apply to dog and cat food sold through other retail outlets, such as pet stores.
2. Inventory change and imports would not significantly affect the revenue estimate.

### Benefits Received

Surveys by Kellert (1978, 1980) indicated that pet ownership was related to companionship or family considerations and had few direct ties to wildlife appreciation. The surveys also indicated that pet owners' knowledge of wildlife was considerably below that of wildlife activity groups (e.g., backpackers and bird watchers). In addition, a pet owner's affection toward their pets generally was not transferred to wildlife. Thus, pet owners showed little specific interest in wildlife. Based on this information, the benefits received linkage for dog and cat foods would not be strong. Although many people who own a pet engage in nonconsumptive wildlife use, pet ownership does not increase the probability of being a nonconsumptive wildlife user.

### Ability to Pay

Ownership of pets is very widespread (Kellert 1978). However, data were not available on expenditures by income class or by age. A demographic profile of pet owners was not available, and a detailed analysis was impossible (Davis pers. comm).

Based on information from the Pet Food Institute, the average retail expenditure per year was \$85 for a household owning a dog and \$67 for a household owning a cat. Therefore, a 5% excise tax at the manufacturers' level would result in a \$2.12 annual tax burden on households owning a dog and a \$1.70 annual burden on households owning a cat. Given the small size of the excise tax relative to income, ability to pay might not be a major concern, regardless of the expenditure pattern.

If pet food purchasers follow typical patterns, expenditures on dog and cat food would be expected to rise slowly with income. The number and size of pets, as well as the relative cost of the food purchased would probably not rise in exact proportion to income. Therefore, a potential tax would likely be regressive.

## T. POTENTIAL TAX OR SURCHARGE ON FEDERAL TIMBER SALES

### Funding Potential

U.S. Forest Service commercial and cost sales of timber in 1980 were \$730 million (U.S. Department of Commerce 1981a). Timber sales on other public lands were approximately \$15 million in 1982 (U.S. Bureau of Land Management 1983). Therefore, total commercial sales were about \$745 million in 1980. A 1 to 5% surtax would have yielded potential gross revenues of about \$7.5 to \$37.3 million, unadjusted for any reduction in sales due to higher prices resulting from the tax.

### Benefits Received

A tax on Federal timber sales probably would be paid by pass-through, mostly to the purchasers of new homes, or would result in reduced bids for Federal timber purchases when the private timber supply was a substitute source. In the first instance, the tax would be borne by the fairly small number of new home purchasers, while the benefits of State wildlife programs would accrue to a much larger portion of the population. If lower bids for timber were the result, Federal payments to counties in lieu of taxes would decrease. The burden would be borne by all taxpayers if additional taxes were levied to offset reduced revenues. In either case, a low correlation would be expected between payments and benefits received.

### Ability to Pay

Information about which goods contain a large percentage of products from publicly managed forests and how expenditures on these goods vary with income or age would be needed for an analysis of ability to pay effects from the consumers' viewpoint. These data were not available. Data about each company harvesting Federal timber would be needed to analyze ability to pay effects from the producer side. These data also were unavailable.

## U. POTENTIAL TAX OR FEE ON FEDERAL FIREWOOD SALES

### Funding Potential

U.S. Forest Service firewood free use volume was about 2.1 billion board feet in 1980 (U.S. Department of Commerce 1981a), equivalent to approximately 4.1 million cords. Free use on other public lands was about 75,000 cords (U.S. Bureau of Land Management 1983). Total firewood free use for 1980 was about 4.2 million cords. Fees of \$0.50 to \$1.00 per cord would have resulted in a potential gross revenue of about \$2.1 to \$4.2 million, unadjusted for any reduction in sales due to higher prices resulting from a tax or fee.

### Benefits Received

Firewood fees would be paid by the individuals who harvested or used the wood. These persons may be oriented toward outdoor activities that involve either wildlife observation or other consumptive or nonconsumptive wildlife

activities. They might pass through or by wildlife management areas enroute to a Federal firewood harvest site or harvest wood at State firewood sites that included potential management sites for nongame programs. Therefore, potential taxpayers may benefit from State wildlife programs. However, data were not available that showed the actual benefits received, if any.

#### Ability to Pay

Information on the collection of firewood from Federal lands by income class was not available, possibly because widespread firewood collection is a relatively new phenomenon. The most likely distribution would be as follows:

1. Urban poor would be less affected by this potential tax because they generally do not have the vehicles or chainsaws necessary to harvest wood in National Forests or may not have fireplaces or wood stoves. Few would purchase the good, and few would pay the tax.
2. Rural poor might be negatively affected because they may rely on firewood from Federal land for heating, particularly in the West.
3. Middle income individuals may be negatively affected because many persons in this income bracket have recently switched to wood heating or increased use of wood harvested from Federal land.
4. Upper income individuals generally would be less affected by a tax on Federal firewood because they probably purchase minimal quantities each year, primarily for fireplace aesthetics, rather than for heating.

#### V. POTENTIAL 5 TO 10% EXCISE TAX ON WILDLIFE ART SALES, LEVIED AT THE DEALER/IMPORTER LEVEL

##### Funding Potential

The March-April, 1983, issue of Wildlife Art News listed some 600 different prints and their prices. Assuming sales of 750 copies per print listed (Vance pers. comm.), sales from this list alone would be approximately \$94.5 million. Assuming that the issues are sold out in 1 year and that well over one-half of the wildlife art business consists of print sales (Vance pers. comm.), wildlife art sales are estimated to be in excess of \$150 million each year. Thus, a potential tax of 5 to 10% on wildlife prints at the dealer level would yield \$7.5 to \$15 million annually, unadjusted for any change in sales due to higher prices resulting from a tax. The estimated revenue would be increased by potential duty on imports of wildlife art.

However, potential tax receipts probably would be substantially less because wildlife art would be difficult to classify. What constitutes wildlife art is a subjective judgement, and dealers and importers may reclassify wildlife art to other types of art that are not taxed. Historically, art as a commodity has not lent itself to a clear definition. The distinction of

wildlife art from other art would probably result in administrative and legal actions. Defining and administering a tax that tries to define how much of a wildlife emphasis is required to be considered wildlife art would be a complex and involved process with high administrative costs.

#### Benefits Received

The Wildlife Art News (1983) estimated that 79% of their readers hunt at least twice a year and that 72% fish at least three times a year. Sixty-three percent of their readers purchase or use photographic equipment regularly, and 70% of their readers purchase duck stamps. These survey results are probably reflective of all buyers of wildlife art. Thus, a large number of wildlife art purchasers benefit from consumptive uses of fish and wildlife and probably also benefit from nonconsumptive wildlife uses. Less direct enjoyment of wildlife is derived from observing their wildlife art.

#### Ability to Pay

Potential revenue probably would be collected disproportionately from individuals in higher income strata in the population. Wildlife art generally would be a discretionary consumer purchase, not an essential item. For instance, 56% of the purchasers of limited edition prints have incomes in excess of \$35,000 (Wildlife Art News 1983). Only 9% of the purchasers have incomes below \$20,000.

W. POTENTIAL 1 TO 5% EXCISE TAX ON DOWNHILL SKIS AND EQUIPMENT, LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

#### Funding Potential

Retail sales of downhill skis, boots, and bindings in 1980 were \$264,400,000 (National Sporting Goods Association 1983). Data developed by the Bureau of Economic Analysis, U.S. Department of Commerce (Horowitz pers. comm.), indicated that in 1972 about 57.9% of the sales in the sporting and athletic goods category that included downhill skis, boots, and bindings was income to producers (Horowitz pers. comm.). Therefore, a potential 1 to 5% excise tax at the producer/importer level would yield \$1.5 to \$7.7 million, unadjusted for any reduction in sales due to higher prices resulting from a tax.

These estimates were based on the following assumptions:

1. The estimated average producer portion of sales for the entire sporting and athletic goods category is applicable to downhill skis, boots, and bindings and to imports of these products.
2. The percent of retail sales paid to producers in 1972 and in 1980 was the same.

### Benefits Received

The purchasers of downhill ski equipment may benefit from observing wildlife in natural areas adjacent to downhill ski runs. Although some money might be expended on habitat management in ski areas, few benefits would occur during the winter when skiers are present. The potential benefits received link would be increased to the extent that downhill skiers would enjoy viewing wildlife while traveling to and from ski areas, but still would be low.

### Ability to Pay

The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) combined snowshoes and downhill and cross country skis. However, these were the most detailed data available. The average retail expenditure by a household purchasing skis and snowshoes in 1980 was \$151. A 5% tax at the manufacturer/importer level would have resulted in a tax payment of \$3 to \$5 in the year the purchase was made. The annual burden of the tax would be only \$1.50 if the skis and snowshoes had a 2 to 3 year life expectancy. Above average expenditures were concentrated in the 35 to 54 age brackets and the middle and upper income households. Although less than 0.1% of income would be devoted to paying the tax in the year the expenditure was made, the tax would be regressive because tax payment, as a percent of income, would fall as income increased.

### X. POTENTIAL 1 TO 5% EXCISE TAX ON CROSS COUNTRY SKIS AND EQUIPMENT, LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

#### Funding Potential

Retail sales of cross country skis, boots, and bindings in 1980 were \$116,800,000 (National Sporting Goods Association 1983). Data developed by the Bureau of Economic Analysis, U.S. Department of Commerce, indicated that in 1972 about 57.9% of sales in the sporting and athletic goods category that included cross country skis, boots, and bindings were income to producers (Horowitz pers. comm.). Therefore, estimated shipments were \$67.6 million, including imports, which would yield \$0.7 to \$3.4 million in potential revenue at 1 and 5% potential tax rates, unadjusted for any reduction in sales due to higher prices resulting from a tax.

These estimates were based on the following assumptions:

1. The estimated average producer portion of the entire sporting and athletic goods category also is applicable to cross country skis, boots, bindings, and poles and to imports of these products.
2. The percent paid to producers in 1972 and in 1980 was the same.

### Benefits Received

The benefits received linkage between cross country skis and non-consumptive use of wildlife is positive. Analysis of the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of the Interior and U.S. Department of Commerce 1982) by Shaw and Mangun (1984) indicated that 7.9% of the persons who bought cross country ski equipment did so with nonconsumptive use of wildlife as their primary purpose. Over 40% of cross country skiing trips included wildlife viewing as a secondary purpose, and the presence of wildlife was an important reason for selecting the recreation area visited.

Cross country skiers in many States may benefit from habitat acquisition financed by excise taxes, as well as from increased wildlife populations. Cross country skiers tend to be active recreationally all year and may benefit from nongame programs at times other than winter.

### Ability to Pay

Ability to pay effects would be similar to those discussed for downhill skis.

### Y. POTENTIAL 1 TO 5% EXCISE TAX ON WATER SKIS, INCLUDING BINDINGS, LEVIED AT THE MANUFACTURER/IMPORTER LEVEL

### Funding Potential

Retail sales of water skis and bindings in 1980 were \$123 million (National Sporting Goods Association 1983). Data developed by the Bureau of Economic Analysis, U.S. Department of Commerce (Horowitz pers. comm.), indicated that in 1972 about 57.9% of sales in the sporting and athletic goods category that included water skis and bindings were income to producers (Horowitz pers. comm.). Therefore, estimated shipments by producers and importers were \$71 million, which would yield \$0.7 to \$3.6 million in potential revenue at 1 and 5% potential tax rates, respectively, unadjusted for any reduction in sales due to higher prices resulting from a tax. These estimates assume that importer margins are comparable to domestic producers.

### Benefits Received

An excise tax on these items would have a weak benefits received link. Although water skiing occurs outdoors, the importance of wildlife to water skiers may be quite low. That is, the success of the activity does not depend on wildlife, as does bird watching. The extent to which water skiing activities are enhanced by seeing wildlife is unknown but probably is not large.

### Ability to Pay

No data were available that could be used to analyze ability to pay.

#### APPENDIX D. SUMMARY OF RESPONDENTS' VIEWS ABOUT THE POTENTIAL FUNDING SOURCES

On October 28, 1983, the U.S. Fish and Wildlife Service announced, in the Federal Register (Vol. 28, No. 210) (Appendix E), that a study of potential sources of funding for the Fish and Wildlife Conservation Act of 1980 was being conducted, as directed by Congress. This announcement, together with a cover memo explaining the study and requesting information, was distributed to approximately 500 manufacturers, retailers, trade and manufacturing representatives, conservation organizations, State fish and wildlife agencies, and other potentially affected parties. The announcement was intended to alert such parties to the study and invite them to comment and provide any available detailed information that would be useful in the study.

A news release was prepared and distributed Nationally to over 2,000 media outlets, including the major wire services, newspapers, State fish and wildlife agencies, and conservation organizations. Similar releases were made through the Regional Public Affairs Offices of the Fish and Wildlife Service to regional and local news sources.

The original deadline for comments announced in the Federal Register was December 12, 1983. This deadline was extended to January 12, 1984, in response to requests from several persons who were unable to meet the original deadline. A follow-up letter requesting additional data that might be available was sent to the original mailing list and to respondents who had replied to the original announcement by April 19, 1984. The following analysis of respondents' views was based on responses received on or before the January 12, 1984, deadline. Although large numbers of comments were received after this date, they did not materially alter the positions represented by the earlier respondents. Data provided by all respondents, regardless of the date received, were used in the study analysis wherever appropriate.

Comments were divided into four major categories, based on the affiliation of the respondent: (1) manufacturers' representatives, retail and trade associations, and special consumer groups; (2) conservation organizations; (3) State fish and wildlife agencies; and (4) the general public. Responses were tabulated and analyzed for each potential funding source. In addition, combined responses from the manufacturing, retail, trade and consumer groups; conservation organizations; and State fish and wildlife agencies were summarized. All opinions and statements appearing as fact in the following analysis are those of the respondents and do not reflect conclusions by the study team.



## GENERAL FUND

The proposal to fund the nongame program out of annual appropriations was one of only four potential revenue sources that received more favorable responses than negative responses. There was no well-defined constituency group either for or against this proposal. Many respondents who favored funding through annual appropriations indicated that it would be more equitable than most other alternatives because all citizens own nongame and, therefore, should pay for its management. Two large conservation organizations indicated that this source should be considered for full funding of the proposed program, with supplemental funding from other sources for special projects. However, many respondents who supported the general fund approach cautioned that such funding probably would vary because of competing demands for annual appropriations. It also was pointed out that such funding would require annual lobbying.

Opponents to the proposed use of annual appropriations for a nongame program were divided into three categories: (1) respondents who supported the concept of a nongame program, but did not think the general fund accurately targeted the users; (2) respondents who did not support a nongame program and, consequently, saw no need for any tax; and (3) respondents who supported the program, but did not believe that the general fund would result in a stable level of funding and, thus, should not be considered.

## WILD-BIRD SEED AND OTHER WILD-BIRD PRODUCTS

Responses to the potential excise tax on wild-bird seed, feeders, houses, baths, and bath heaters were combined because the respondents generally referred to several of these commodities, rather than just one. The responses received from wild-bird seed companies and manufacturers of wild-bird houses, feeders, and baths were the most detailed responses of all and, without exception, opposed the proposed excise tax. However, some companies expressed support for the program and suggested funding from other sources. Wild-bird seed producers emphasized several points repeatedly in their responses, including:

1. Congress did not include an 11% tax in the Fish and Wildlife Conservation Act of 1980, after extensive hearings on the potential impact of such a tax, because the tax: (a) would not have produced adequate revenue to fund the program; (b) would have placed an inequitable burden on a small industry; and (c) would have affected many elderly people on fixed incomes who feed birds as a hobby.
2. The Fish and Wildlife Conservation Act of 1980 provides for at least 3,700 species of wildlife, including 600 species of birds, of which only 13 to 16 are more than occasional consumers of backyard wild-bird seed. Thus, wild-bird seed purchasers would be disproportionately taxed to fund the Act.

3. Wild-bird seed purchasers already benefit wildlife; therefore, persons who are already contributing to nongame programs would be unfairly taxed.
4. Most wild-bird seed is purchased in the northern tier of States; thus, the tax would be unequitable.
5. The tax would be passed on to consumers and would result in a corresponding higher sales price and decrease in sales, thus reducing existing benefits to wildlife.
6. Product identification would be very difficult because wild-bird seed consists of a wide variety of unmixed and mixed seeds, including poultry feed, livestock feed, wild and caged bird seed, and, in some instances, human food.

One seed trade association respondent asked that the purpose of the program be made more explicit and pointed out that how and where the money would be spent has not been identified clearly. Several seed companies and trade associations also asked why wildlife conservation programs of National interest were not paid for by general revenue funds and why programs of local concern, such as State nongame programs, were not paid for by State funds, such as State income tax checkoff revenues.

Manufacturers of bird houses, baths, and feeders expressed the opinion that their products benefited birds and that persons who purchased their products already contributed to nongame programs. It was further suggested that a tax would add to prices that had already substantially increased in recent years, reducing sales and corresponding benefits to wildlife.

Private citizens who opposed excise taxes on wild-bird products almost without exception pointed out the benefits that result to birds because of their purchases and expressed dismay that they were being considered for additional taxes to pay for nongame programs. A number of respondents indicated they, or relatives who also fed birds, were retired, unemployed, or living on small fixed incomes.

Almost half of the positive responses came from conservation organizations and State fish and wildlife agencies. Other positive responses came from professional conservationists and concerned individuals willing to pay or from users of other commodities, such as off-road and recreational vehicles, who believed that users other than themselves should pay.

#### WILD-ANIMAL FURS

There were more responses to the proposed excise tax on wild-animal furs than for any other product. Based on the comments, both pro and con, the feelings of the respondents appeared to be very intense.

The majority of respondents favoring the tax viewed trapping and trappers negatively and saw the tax principally as an opportunity to discourage or stop

trapping, not as a means to raise revenue for a nongame program. These individuals encouraged the Fish and Wildlife Service to place higher taxes on furs; some respondents suggested higher taxes than the 10% maximum considered in the study. Proponents of the tax typically indicated that trapping caused suffering and pain to wild animals, eliminated important predators, and resulted in accidental captures and injury to pets and children. Many proponents of the tax believed that it would reduce profits to trappers to the extent that they would lose their economic incentive to trap.

The vast majority of opponents to the tax were trappers and trapping associations. These respondents viewed trapping as a legitimate outdoor sport, comparable to hunting and fishing. Trappers believed that they performed an important pest/predator control function. They also believed that the tax would reduce profits and limit the incentive to trap. Some trappers indicated that the cost of trapping licenses, excise taxes paid on firearms and ammunition, and sales taxes on traps and other supplies made trapping a marginal activity at best. Some respondents indicated that they were in a very low income bracket and that trapping provided an important source of supplemental income. Trapping also was considered one of the first and most important outdoor recreation activities for youths. A large number of trappers pointed out that, according to the Fish and Wildlife Conservation Act of 1980, furbearers were not considered nongame animals. Therefore, a tax on furbearers would not be an appropriate source of revenue for a nongame program.

Most State fish and wildlife agencies and conservation organizations concurred with trappers that an excise tax on wild furs was not an appropriate source of revenue for a program that would benefit nongame species.

#### BACKPACKING AND CAMPING EQUIPMENT

Respondents who opposed the proposed excise tax on camping and backpacking equipment far outnumbered those who favored the tax. Most opposition came from manufacturers, importers, and retailers and from camping and hiking associations. Individual negative responses included campers and backpackers, who often reflected one or more association positions. This group included individuals against all taxes, as well as persons who favored a nongame program but believed it should be funded by some other source.

Sellers, retailers and manufacturers, often voiced one or more of the following positions regarding the impact of the potential tax on equipment sales. Sellers believed that the substantial export market for U.S.-made products would be disastrously affected because the price of products would be increased by the tax to the point where they would no longer be competitive. Importers would be able to absorb the proposed tax more easily than U.S. manufacturers and would increasingly dominate the U.S. market. Any increase in the manufacturing price would be passed on to the consumer, with a negative impact on the current economic recovery. The increase in price resulting from the proposed tax would give larger companies a competitive advantage over smaller ones. Finally, the administration of the tax would be costly to the industry.

Several sellers and the camping associations pointed out that the tax would adversely impact the camping and hiking public. Children from lower and middle income families, who participate in organized camps, would have to pay higher camp fees to cover the purchase of more expensive equipment. Boy Scouts, Girl Scouts, Campfire Girls, and other organizations involved in camping activities also would be affected by these proposed taxes.

Sellers stated that the relationship between taxpayers and beneficiaries of the proposed nongame program would be tenuous because camping and backpacking equipment are not always used for recreational camping. Sleeping bags frequently are used in backyards or in the home. Campstoves, lanterns, and tent heaters often are purchased for emergency use. Daypacks and backpacks frequently are used as schoolbags or luggage. In addition, many campers who buy this equipment are hunters or anglers who already pay excise taxes related to their sport. The hiking association pointed out that money obtained from this tax would not be used to construct better trails, that hikers perform a lot of volunteer work, and that the taxes might discourage hiking and camping.

The industry made the point that a tax would be better applied to persons who destroy habitat than to those who use it beneficially. Specifically, real estate developers, timber companies, agriculture developers, smelters, and power plant and other land modification projects would make little or no contribution toward the management of wildlife. Increasing user fees (taxes) would effectively eliminate people in lower income brackets from the use of public lands. The tax would be regressive because it would shift the legitimate governmental function of stewardship of our Nations' wildlife to a very small segment of society.

The proponents of an excise tax on camping and backpacking equipment did not provide a detailed justification for their position. Proponents generally indicated that campers and backpackers use wildlife habitat, and it is reasonable to expect them to support programs that protect and manage these resources. Proponents of this tax were mainly professional or amateur wildlife enthusiasts; managers or scientists; a few hunters, trappers, and anglers who stated that general recreationists did not pay their fair share; conservation organizations; and State fish and wildlife agencies.

#### OFF-ROAD VEHICLES

Respondents were opposed to the proposed tax on off-road vehicles by a ratio of three to one. Manufacturers, dealers, manufacturing associations, off-road vehicle clubs (snowmobiles, motorcycles, and four-wheel drives), and owners were the major groups that opposed the tax. Proponents of the tax did not belong to a well-defined group.

Snowmobilers indicated that there was no direct relationship between themselves and beneficiaries of the program and that sales of snowmobiles were depressed the last 4 years. They stated that the proposed excise tax would threaten the industry's future. Snowmobilers also indicated that wildlife areas probably would be closed to their use, and they would be paying for programs unrelated to their sport.

Manufacturers' representatives for all-terrain vehicles indicated that it would be difficult to expect buyers of these products to pay for nongame programs when nonrecreational purchases are about 30% of the total sales. They expressed the view that funding should come from the general fund, user fees, or both.

Motorcycle manufacturers and dealers and motorcycle clubs contributed more comments than any other off-road vehicle group. These groups saw no link between recreational users of motorcycles and nongame programs. They pointed out that they were typically prohibited from using wildlife preserves and similar lands under State control. Foreign motorcycle manufacturers indicated that they already face 49.4% tariffs on heavyweight bikes.

Four-wheel drive manufacturers and user groups were equally opposed to excise taxes on their vehicles. One manufacturing association provided detailed data indicating that four-wheel drive vehicles are used only infrequently off the road. The association pointed out that transportation census data indicated no significant difference in the use of four-wheel and two-wheel drive trucks. Therefore, they believed that there was no justification for the user charge principle. One large corporation indicated that a 2 to 5% tax would probably cause many consumers to reconsider their decision to buy a four-wheel drive vehicle.

Conservation groups did not favor a tax on off-road vehicles, but State fish and wildlife agencies did. At least one State pointed out, however, that they would decline the funds if the tax encouraged the opening of wildlife areas to off-road vehicle use. Other States, as well as some individuals, pointed out the adverse impacts of off-road vehicle use on wildlife and indicated that these impacts justified the proposed tax.

#### BINOCULARS, MONOCULARS, AND SPOTTING SCOPES

Respondents opposed to the proposed tax on binoculars, monoculars, and spotting scopes outnumbered those who were in favor of the tax. Respondents with negative views generally were of the opinion that most binoculars were not purchased for observing wildlife. One consumer survey, reported by a manufacturing concern, seemed to be the basis for this opinion. This survey of 19,000 consumers indicated that 7% used binoculars for bird watching and nature study, 13% for sight-seeing and vacationing, and 53% for multiple uses. Stadium sports and all forms of racing and boating were considered the major use of binoculars. Manufacturers and retailers generally expressed the view that the proposed tax would be inflationary, discourage sales, increase paperwork, and unfairly impact a particular socioeconomic segment of society.

About half of the positive responses came from conservation organizations and State fish and wildlife agencies. The remainder were from outdoor enthusiasts who were willing to support a nongame program.

## WILDLIFE IDENTIFICATION BOOKS

Slightly more respondents were in favor of the proposed excise tax on wildlife identification books than were opposed to the tax. Most conservation organizations did not comment on this proposed source, but the few that did were largely in favor of it. The State fish and wildlife agencies that responded endorsed the idea by a ratio of over four to one.

No well-defined constituency group was opposed to this potential tax source, in contrast to the other products considered. However, responses from sources, other than conservation organizations and States, were slightly more opposed to the proposal than in favor. Although most respondents did not include a specific reason for their position, either pro or con, one respondent indicated that wildlife identification books probably provided an incentive to the public to "help" wildlife through increased public awareness. Therefore, the respondent thought that a tax on this source would be inappropriate.

## FEDERAL LAND FEES

Respondents were almost evenly divided about the proposed fee on recreational use of Federal lands. There was no well-defined constituency group on either side of the issue, except for one conservation association that was strongly opposed to the proposed tax as it applied to wildlife refuges. This association stated that this fee would place pressure on refuges to produce revenue to the detriment of wildlife resources. Some respondents questioned the administrative costs associated with the collection and management of an expanded fee system.

It was pointed out that most Bureau of Reclamation recreation areas are administered by other Federal agencies or local organizations, such as State and county governments and water user associations, and that current fees barely cover administrative costs. Therefore, respondents indicated that it would be inappropriate for the Bureau of Reclamation to collect fees to support nongame programs until the costs of operating and maintaining recreation areas were covered by fees.

## VOLUNTEER TAX CHECKOFF

The volunteer tax checkoff was one of only four potential funding sources that respondents favored more than they opposed. It was the most favored alternative. Although more State fish and wildlife agencies and conservation organizations favored this source than opposed it, support was cautious. The point was raised repeatedly that this funding source might compete with similar, on-going checkoff programs in a number of States.

This funding source was favored by many respondents because they believed that it targeted the user more accurately than any other potential funding source. However, a number of respondents were concerned that, if a special nongame checkoff were enacted, a large number of other special interest groups would insist that they also be given the opportunity to be included on the tax

checkoff form. The respondents indicated that this pressure would discourage Congress from supporting this funding source or would result in so many items on the checkoff list that revenues would be reduced severely.

#### SEMIPOSTAL STAMPS

Semipostal stamps were considered favorably by more respondents than unfavorably. The main reason for this support was that sales of nongame stamps would be a voluntary measure that would accurately reflect a user-benefit relationship.

Several respondents, including proponents, were concerned that the administrative costs of printing and selling semipostal stamps would be so high that there would be little net revenue. Several respondents indicated that they anticipated relatively low sales of such stamps. Other respondents pointed out that semipostal stamps are successfully sold in other countries. Some opponents did not include a reason for their opposition; others indicated a general displeasure toward any new Federal program or did not see the need for a nongame program.

#### RECREATIONAL DIVING EQUIPMENT

The vast majority of respondents to the proposed excise tax on recreational diving equipment were opposed to the tax. Most of the negative replies were from retail diving equipment stores, manufacturers, and diving schools. However, conservation organizations also were decidedly opposed to the proposal, and State fish and wildlife agencies were evenly divided for and against the proposed tax. Manufacturers and retailers opposed to the tax generally expressed the opinion that it would place an unfair burden on their business, resulting in financial hardship. Several respondents stated that recreational diving was largely a passive activity, with no adverse impacts on fish and wildlife, and, thus, should not be taxed. The principal manufacturing association for diving equipment pointed out that:

1. levying an excise tax at the manufacturer/importer level would result in a proportional increase in price at the consumer level;
2. industry demographics indicate a resistance to price increases that would result in reduced sales if a tax was enacted;
3. the recreational diving industry has seen little growth since 1974; and
4. funding a Federal program to support State grants is contrary to the concept of less Federal government control.

## PHOTOGRAPHIC EQUIPMENT AND FILM

Negative responses to a proposed excise tax on photographic equipment and film outnumbered positive ones by over two to one. Most of the opponents indicated that wildlife photography was such a small part of the total use of photographic equipment that the tax would be inappropriate. State fish and wildlife agencies and conservation organizations were slightly more in favor of this tax than against it.

One major manufacturing association, which indicated that it represented 90% of all photographic products manufactured in this country, provided detailed reasons for its opposition to the tax. The key to its opposition was the belief that there was a poor relationship between potential taxpayers and beneficiaries of the program. The association indicated that two-thirds of its products were used by industrial and commercial customers and apparently would not be included in the proposed tax. The association stated that the tax would have a negative effect on sales of amateur-type photographic products because they are generally purchased with discretionary dollars.

## LOCATABLE MINERALS

Opponents to the proposed excise tax on locatable minerals were only slightly more numerous than proponents. Proponents included several State fish and wildlife agencies, while most conservation organizations provided no specific response. Some proponents of the tax indicated that it was justified because of the potential negative impacts of mining on natural resources.

There apparently was considerable confusion about the definition of locatable minerals as it would relate to the tax. However, opponents generally concluded that: (1) the tax would bear no relation to the nongame program because there would be no user benefits; (2) the tax would be discriminatory because it would single out mining but exclude grazing, timber cutting, and other uses of Federal land; and (3) the proposed tax would be an anticonservation measure because it would decrease the amount of ore that could be commercially mined.

One Federal land management agency objected to the proposed tax for two reasons: (1) mining claimants generally receive a patent for locatable minerals produced at a profit under present laws, which would eliminate this source of funding as presently proposed; and (2) the reasons for targeting locatable minerals is not clear because the production of leasable and saleable minerals has as much effect on, or relation to, nongame wildlife as locatable minerals.

Another Federal agency pointed out that the Federal Government has little control over the location patent process and only collects royalties and rentals on locatable minerals on acquired lands. Little or no revenue could be expected for some time even if offshore locatable minerals were added to the tax. In addition, this agency did not believe that the tax would be



equitable. One conservation association was strongly opposed to this tax because it would apply to refuges where it might encourage mining to the detriment of wildlife.

## RECREATIONAL VEHICLES AND CAMPER TRAILERS

Responses to a proposed excise tax on recreational vehicles and on camper trailers were combined because the comments on these products were similar. Opponents of this proposed tax outnumbered proponents by a ratio of over four to one. Most of the negative comments came from the manufacturing industry, owners and users of recreational vehicles and camping trailers, and campground operators. The majority of State fish and wildlife agencies and conservation organizations also opposed this proposed excise tax.

Several manufacturers pointed out that many recreational vehicle users limit use of their vehicles to touring, business functions, and attending conventions. They stated that it would be unfair to assume that all, or even a majority, of recreational vehicle use is in conjunction with outdoor camping activities associated with wildlife. Recreational vehicle manufacturers pointed out that a flat tax would be unfair, because recreational vehicles and camper trailers often are quite expensive, compared to other recreational camping options. Several manufacturers pointed out that this tax would be a specialty tax, rather than a user tax, because there would be no direct user-benefit connection. One recreational vehicle association indicated that any attempt to fund a nongame program for all citizens through special taxes would be inappropriate and that such funding should come from the general fund.

## ANALYSIS OF RESPONSES FROM SPECIAL INTEREST GROUPS

The following analysis indicates how the different special interest groups perceived the various tax alternatives.

General conservation organizations. Responses were received from many of the major National conservation organizations and several organizations with a Regional affiliation. Although support for the taxing options varied, all of the conservation organizations, except one, supported public funding of a nongame Federal aid program.

One large National conservation organization indicated that full funding for the program should come from the general fund, with funding for special projects obtained from other sources. Another large conservation group suggested that annual appropriations be used to fund a comprehensive wildlife management effort that reflected a National commitment and distributed costs to all citizens. They indicated that a combination of other sources, except excise taxes on wild furs, also should be considered for potential funding. They pointed out that the administration of a funding program involving a wide range of revenue sources would be costly and difficult, lending support to the idea that an annual appropriation would be more appropriate.

A third group suggested that nearly all the funding sources, except annual appropriations, met the standards of equitability required for the statute and cautioned against an overly rigid interpretation of that standard. Another group strongly favored alternatives that were closely identified with the program.

One professional society did not strongly endorse any funding source, but indicated that excise taxes on binoculars, wild-bird products, and wildlife guides most nearly qualified as user-paid sources of funds. However, another association indicated that taxing binoculars, wild-bird products, and field guides would only result in the transfer of money from private sector nongame support to public sector support and was, therefore, questionable. This association also expressed a strong negative reaction to proposed user fees on Federal lands and water and excise taxes on certain locatable minerals, especially as applied to Refuges. They stated that these taxes would encourage the improper use of Refuge lands.

Several conservation organizations expressed concern about the potential unreliability of funding from annual appropriations. Caution was also expressed about a nongame checkoff on Federal tax forms, because it might detract from similar State programs. The majority of the conservation organizations indicated that taxes on off-road vehicles, motorhomes, camping trailers, and recreational diving equipment were inappropriate. Several organizations believed that excise taxes on these items would provide an incentive for increased destruction of wildlife and/or wildlife habitat because administrators might encourage the improper use of public lands by off-road vehicles, for camping, or for other noncompatible uses. The majority of conservation organizations opposed taxing wild furs to support a nongame program.

State conservation agencies. The majority of the State fish and wildlife agencies responded to the Federal Register Announcement. Several States offered no specific suggestions, but endorsed the study and indicated a need for funds to support their respective nongame programs. Generally, the more direct the perceived user-benefit relation between the proposed revenue source and the potential taxpayer, the stronger the support by the States. There was strong support for proposed taxes on wild-bird products and little support for proposed taxes on camping trailers and recreational vehicles. One State suggested that a tax be levied on wildlife art, including paintings, prints, sculptures, and similar objects, as an alternative funding source. Some concern was expressed that a volunteer tax checkoff would conflict or compete with ongoing State checkoff programs.

Most States said that the proposed tax on wild furs should be deleted from consideration because furbearers were not considered nongame animals by the Fish and Wildlife Conservation Act of 1980. Some States already license trappers and indicated that this tax would place an additional burden on them.

Manufacturers representatives, trade associations, and special consumer groups. Responses from manufacturers and retail associations, trade associations, and special consumer or user groups can be characterized, almost without exception, as opposed to excise taxes on the commodities that they produce,

sell, or use. Most of these groups did not comment about potential excise taxes on other commodities. Some organizations expressed support for the concept of a nongame program and the principle of voluntary or user support.

Because respondents in this category generally restricted their responses to the commodity that they produced, their comments are well represented in the analysis of individual funding sources. These respondents generally stated that placing an excise tax on the commodity that they produce would result in an increased price to the consumer, reduced sales by the industry, reduced income to the industry, and financial hardship.

#### ALTERNATIVE FUNDING SOURCES SUGGESTED BY RESPONDENTS

Several alternative funding sources not included in the Federal Register announcement were suggested by respondents. These sources were:

1. An excise tax on wildlife art, including paintings, drawings, limited edition prints, sculptures, antler and ivory carvings, stained glass, and wood carvings, including both modern and antique wooden waterfowl decoys. (Some information was developed on this potential source, see Appendix C.)
2. Taxation of land development activities that adversely impact habitat, including channelization, wetland filling, highway development, dredging, utility rights-of-way, and barge fleeting. (See Addendum for information on this potential source.)
3. An excise tax on traps, lures, and other trapping equipment, rather than a direct tax on furs.
4. A percentage of the membership dues from conservation organizations.
5. Work relief programs for persons on welfare to support nongame management programs.
6. Establishment of a recreation fee structure that would provide 50% of the revenue needed for the nongame program, with the other 50% obtained by linking a general fund appropriation "to some other source".
7. A tax on leasable minerals, similar to the one proposed for locatable minerals.
8. Discontinue the tax exempt status of conservation groups and allocate the revenue to the nongame program.

APPENDIX E. FEDERAL REGISTER ANNOUNCEMENT

# Test Report Project

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Friday  
October 28, 1983

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## Part III

### Department of the Interior

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#### Fish and Wildlife Service

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Study Concerning Potential Sources of  
Funding; Fish and Wildlife Conservation  
Act of 1980

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****Study Concerning Potential Sources of Funding; Fish and Wildlife Conservation Act of 1980**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice.

**SUMMARY:** The Service is identifying and evaluating potential sources of revenue for funding the Fish and Wildlife Conservation Act of 1980. Sec. 12 of that Act instructed the Service to conduct a study to determine the most equitable and effective mechanism for funding the program and to provide the results along with the Director's recommendations to the appropriate Congressional committees by December 31, 1984. The purpose of this notice is to inform potentially affected parties and invite comments to be utilized in the study.

**DATE:** Comments should be submitted on or before December 12, 1983.

**ADDRESS:** Written statements should be addressed to the Associate Director—Federal Assistance, U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C. 20240. Comments received will be available for examination in Room 638, 1000 N. Glebe Road, Arlington, Virginia, between 7:45 a.m. and 4:15 p.m., Monday through Friday. Those persons desiring notification of receipt of comments must include a self-addressed, stamped postcard or use the U.S. Postal Service return receipt system.

**FOR FURTHER INFORMATION CONTACT:** Mr. C. Phillip Agee, (703) 235-1528, Division of Federal Aid, 1000 N. Glebe Road, Arlington, Virginia. Office hours for this location are 7:45 a.m. to 4:15 p.m., Monday through Friday.

**SUPPLEMENTARY INFORMATION:****Background**

The Fish and Wildlife Conservation Act of 1980 was enacted September 29, 1980. Its purpose is to provide grants to the States for developing State fish and wildlife conservation plans and for carrying out actions for the benefit of fish and wildlife, especially nongame species and populations. The term nongame is defined to include all unconfined, wild vertebrates which are not ordinarily taken for sport, fur, food, or commerce, are not listed as endangered or threatened under the Endangered Species Act of 1973, are not marine mammals under the Marine Mammal Protection Act of 1972, and are not domesticated species reverted to feral existence.

The Act authorized funding by appropriation for the first 4 years and provided for long-term funding by specifying in Sec. 12:

The Director of the United States Fish and Wildlife Service, in consultation with affected parties, shall conduct a comprehensive study to determine the most equitable and effective mechanism for funding State conservation plans and actions under this Act, including but not limited to, funding by means of an excise tax on appropriate items. On or before December 31, 1984, the Director shall report to the Committee on Environment and Public Works of the Senate and to the Committee on Merchant Marine and Fisheries of the House of Representatives the results of such study, together with his recommendations with respect thereto. (As amended December 31, 1982.)

**Study**

**Preliminary screening:** In 1975 an independent study was published analyzing potential excise taxes on 17 items or groups of items that could be applied to grants for nongame species and estimating the revenue each would yield (Wildlife Management Institute, 1975, "Current Investments, Projected Needs and Potential Sources of Income for Nongame Fish and Wildlife Programs in the United States." 93 pp.). Later, in hearings related to various pieces of proposed legislation for the benefit of nongame, additional sources were suggested in testimony before Congress. From these records, 25 potential sources of funding were selected for consideration in this study. In a preliminary screening, the Fish and Wildlife Service examined each of the 25 regarding: (1) The relationship between the potential contributors of the revenue and the beneficiaries of the program (i.e., Would program costs be paid by the users?); (2) the estimated amount of revenue to be generated each year and the portion of that amount which would be required to administer its collection; and (3) whether the potential revenue tended to be collected disproportionately from certain economic strata in the population. As a result of the screening, several of the 25 potential fund sources were modified or eliminated leaving 18 to be evaluated in detail. The 18 remaining sources being evaluated in this study are as follows:

1. Annual appropriation from the general fund.
2. An excise tax of 5 to 10% on wild-bird seed levied at the manufacturer/importer level.
3. An excise tax of 5 to 10% on wild-bird houses, levied at the manufacturer/importer level.

4. An excise tax of 5 to 10% on wild-bird feeders, levied at the manufacturer/importer level.

5. An excise tax of 5 to 10% on wild-bird waterers, baths, and heaters, levied at the manufacturer/importer level.

6. An excise tax of 5 to 10% on wild furs, levied at the point of their purchase from trappers.

7. An excise tax of 5 to 10% on backpacking and camping equipment (tents, flies, pack frames, packs, camp stoves, lanterns, tent heaters, camp cooking gear, sleeping bags and mattresses), levied at the manufacturer/importer level.

8. An excise tax of 2 to 5% on off-road vehicles (snowmobiles; off-road motorcycles, including trail bikes and three-wheelers; other all-terrain vehicles and four-wheel-drive vehicles), levied at the manufacturer/importer level.

9. An excise tax of 5 to 10% on binoculars, monoculars, and spotting scopes, levied at the manufacturer/importer level.

10. An excise tax of 5 to 10% on wildlife identification books, levied at the publisher/importer level.

11. Fees of \$.50 to \$2.00 (new fees or surcharges on existing fees) on the use of selected Federal lands and waters, including wildlife refuges, national parks, and areas managed by the Forest Service, Bureau of Land Management, Corps of Engineers, Tennessee Valley Authority, and Bureau of Reclamation.

12. Voluntary contribution by checkoff on the Federal income tax return (deductible the following year as a contribution).

13. Sale of semi-postal stamps for nongame, with the contribution being 25 to 50% of the postage value of the stamp.

14. An excise tax of 5 to 10% on recreational diving equipment (masks, snorkels, tanks and attachments, flippers, wetsuits, and spearguns), levied at the manufacturer/importer level.

15. An excise tax of 1 to 5% on photographic equipment and film (still cameras, lenses, filters, and tripods), levied at the manufacturer/importer level.

16. A tax of 1 to 5% on certain locatable minerals extracted from Federal lands and waters where those rights are currently controlled by the Federal Government.

17. An excise tax of 1 to 5% on travel trailers and campers, levied at the manufacturer/importer level.

18. An excise tax of 1 to 5% on motorhomes, levied at the manufacturer/importer level.

**Detailed evaluation:** Each of the 18 potential sources of funds will be evaluated critically. This detailed

evaluation will involve a more thorough application of the criteria used in the preliminary screening in addition to the following factors:

(1) The effect on sales of the commodity or service expected to result from the addition of a tax or fee to the percent cost.

(2) For purposes of revenue collection, the separability of the studied commodity or service from other

commodities or services on which a fee is not to be added.

(3) Changes in legislation and regulations that would be required in order to adopt and implement each potential surface of funds.

(4) The views of parties who may be affected (information to be derived largely from comments submitted in response to this notice).

*Report:* As required by the Act, the findings of this study, together with the

recommendations of the Director, will be delivered to the Chairman of the House Committee on Merchant Marine and Fisheries and the Chairman of the Senate Committee on Environment and Public Works on or before December 31, 1984.

Dated: October 24, 1983.

**Robert A. Jantzen,**  
*Director, Fish and Wildlife Service.*

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**BILLING CODE 4310-55-M**

#### ADDENDUM

In comments received, several potentially affected parties proposed that the cost of the Fish and Wildlife Conservation Act of 1980 should be borne by parties whose activities are potentially destructive, contributing to the need for the Act. To respond to this suggestion, a supplementary study was performed to consider the feasibility of assessing developers and users of Federally-controlled lands. The resulting "developer fees" study was made a part of this report. It examines the feasibility of the commentor's suggestions and identifies and analyzes three potential sources of revenue.



DEVELOPER FEES STUDY: STUDY OF AN ADDITIONAL POTENTIAL  
SOURCE TO IMPLEMENT THE FISH AND WILDLIFE CONSERVATION ACT OF 1980

Prepared for  
U.S. Fish and Wildlife Service  
Western Energy and Land Use Team  
Ft. Collins, CO 80526-2899

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August 1984

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## INTRODUCTION

### STUDY OF POTENTIAL FUNDING SOURCES TO IMPLEMENT THE FISH AND WILDLIFE CONSERVATION ACT OF 1980

The Fish and Wildlife Conservation Act of 1980, Public Law 96-366 (the Forsythe-Chafee Act), authorized the Federal government to provide financial and technical assistance to the States to develop and implement programs for fish and wildlife, especially non-game species. Section 12 of the Act instructed the U.S. Fish and Wildlife Service, in consultation with affected parties, to conduct a comprehensive study to determine the most equitable and effective mechanism for funding State conservation plans and actions under this Act. The statute specified that the study include, but not be limited to, funding by means of excise taxes on appropriate items.

The results of the study were to be presented to Congress, together with recommendations from the Director, U.S. Fish and Wildlife Service, within 30 months after the enactment of the Act. Although Section 11 of the Act authorized the appropriation of \$5 million per year for 4 years for use by the States to develop conservation plans and for use by the U.S. Fish and Wildlife Service to administer the program and conduct the Section 12 study, funds were not appropriated and no action was taken. In December 1982, an amendment was enacted authorizing the U.S. Fish and Wildlife Service to proceed with the study of funding sources. A document entitled "Potential Funding Sources to Implement the Fish and Wildlife Conservation Act of 1980" presents the results of that study (hereinafter referred to as the principal study). Twenty-five potential revenue sources are considered in that document, to which this report serves as an addendum.

#### "Developer Fees" Study

During the public consultation process associated with work on the Section 12 study, the Fish and Wildlife Service received a number of suggestions concerning additional potential revenue sources. One such suggestion was that taxes or charges on development be evaluated as a possible funding source to implement the Fish and Wildlife Conservation Act. It was argued that those who cause adverse impacts on wildlife habitat should help to bear the burden of funding habitat protection or enhancement projects. In response to this suggestion, the Fish and Wildlife Service initiated the present "developer fees" study.

This report presents the results of the "developer fees" study in two parts. Part One, Identification of Candidate Development Activities, is intended to identify a few promising candidates from among the very broad range of activities that can be labeled "development". For this purpose, Part One first establishes initial criteria for selecting a development activity as an appropriate candidate for the imposition or increase of taxes or charges. A number of development activities that have been suggested during the study as potential candidates consistent with the initial criteria are then identified and grouped in appropriate categories. Finally, several of the potential candidates judged to represent particular opportunities for the imposition of new or increased "developer fees" are selected for more detailed evaluation in Part Two.

Part Two, Evaluation of Selected Development Activities, examines three possible funding sources using the criteria applied by the U.S. Fish and Wildlife Service to evaluate the 25 potential revenue sources considered in the principal study.

## PART ONE: IDENTIFICATION OF CANDIDATE DEVELOPMENT ACTIVITIES

### DEVELOPMENT

The range of land use activities that fall within a general definition of development is diverse. The broadest definition of development would include not only intensive urban-type activities that "utilize, improve and/or subdivide land for the purpose of building, expanding or altering structures, but also agricultural and recreational activities that produce goods, services, and satisfactions flowing from the utilization of natural resources and the natural landscape." These diverse activities may occur on public as well as private lands and may be undertaken by government agencies as well as private developers.

Many of these development activities derive a direct and identifiable benefit from the social, economic, political, and environmental characteristics or features of the surrounding community; conversely, many of these activities may also be seen as disrupting or degrading to those same community characteristics or features. Other developments may positively enhance or improve the surroundings.

### CRITERIA FOR IDENTIFYING CANDIDATE DEVELOPMENT ACTIVITIES

The principal study, "Potential Funding Sources to Implement the Fish and Wildlife Conservation Act of 1980" utilizes several criteria for evaluating potential funding sources. These criteria (discussed in Part Two) include: Funding Potential; Economic Efficiency; Benefits Received; and Ability to Pay.

To identify candidate development activities potentially suitable for the imposition of fees or taxes for implementing the Fish and Wildlife Conservation Act, however, it has proven necessary to apply some additional criteria in order to screen the enormous range of activities that can be defined as "development". These initial screening criteria, described below, are applied in order to narrow the universe of development activities to several appropriate candidate activities for further analysis. Four of the criteria utilized in the principal study are then applied in Part Two to evaluate those selected candidate activities.

#### Initial Criteria

Special Federal interest or involvement. In keeping with its terms of reference, this study explores the suitability of "developer fees" for one

specified purpose: as sources of funding for the Fish and Wildlife Conservation Act of 1980. Thus, the study explores the suitability of "developer fees" as a source of the Federal funds which, under the Act, are to be made available, in the form of matching grants, to fund State fish and wildlife programs.

As a practical matter, any taxes or charges levied to provide these Federal funds will be imposed by the Federal government. Much development taxation and fee imposition, however, traditionally falls within the purview of State and local government authorities. Even where there is legal authority for the Federal government to impose development taxes or fees, the strong political impediments to Federal entry into a traditionally non-Federal domain need to be considered in identifying potential funding sources for the Act.

There are several broad classes of development in which the Federal government has special interest or involvement. Examples include development on Federal lands, development that affects adjacent or nearby Federal lands, and development for which the Federal government grants permits, aid, or encouragement. The presence of such Federal interest or involvement appears to significantly increase the opportunity to impose Federal taxes or fees. Accordingly, the presence of such interest or involvement is considered a favorable indicator in identifying candidate opportunities.

Wildlife linkage: benefits received or habitat affected. The principal study applies a "benefits received" criterion derived from the "principle that taxes paid by an individual should correspond to the benefits the individual receives from government services." In the principal study, this criterion was evaluated by considering whether or not payers of the tax would benefit substantially from improvements in the management of wildlife habitat and populations.

Unlike most of the funding sources evaluated in the principal study, however, development activities can be linked to wildlife not only by the benefits received but by the impacts inflicted. That is, instead of (or in addition to) benefiting from the presence of wildlife and wildlife habitat, development can damage or destroy wildlife habitat and thus increase the need for responsive governmental action. It is these negative impacts on habitat that have given rise to public suggestions that developer fees be considered as a funding source under the Fish and Wildlife Conservation Act. In the case of evaluating "developer fees", therefore, it appears appropriate to broaden the "benefits received" criterion into a "wildlife linkage" criterion that can be satisfied either by benefits received or by impacts inflicted on habitat.

Ideally, a candidate activity would be linked, not just to wildlife in general, but to State wildlife programs. This is because, as already noted, developer fees are evaluated in this study as a source of Federal funds which, under the Fish and Wildlife Conservation Act of 1980, are to be passed through to the States to fund State fish and wildlife programs.

To insist upon a State program linkage, however, while also searching for special Federal interest or involvement to satisfy the previous criterion, may in some instances create a "catch 22" situation. For example, many activities

having special Federal interest are located on Federal lands where the linkage to State programs may be less direct than on other lands. The benefits of State wildlife programs, however, appear to be broad enough to permit some of these development activities to satisfy both the benefits received and habitat affected criteria. State wildlife programs, for example, are sometimes directed toward Federal lands. Additionally, migratory species which utilize Federal lands can benefit from State programs on non-Federal lands. Nevertheless, in identifying candidate development activities and funding sources, this study considers the broader "wildlife linkage" criterion as well as the stricter "benefits received" linkage.

Avoiding disruption of complex legislative arrangements. Many of the development activities identified during this study as possible candidates for developer fees (for example, fees charged for grazing rights and the leasing of hydrocarbon resources on the Outer Continental Shelf) are currently governed by complex legislative and administrative arrangements that delicately balance public and private interests. In some cases, the sums of money affected by these arrangements dwarf the sums that might reasonably be raised to fund the Fish and Wildlife Conservation Act of 1980. To reopen such existing complex arrangements for the sole purpose of raising these relatively small sums is unlikely to be feasible and cost effective. Accordingly, the study establishes a "tail shouldn't wag the dog" criterion: development activities are not appropriate for the imposition of developer fees under the Fish and Wildlife Conservation Act if imposing these fees would require the reopening of complex legislative and administrative arrangements. Of course, once such an arrangement is reopened for other reasons, this criterion would not weigh against fees as part of a broader resolution including funding of the Fish and Wildlife Conservation Act.

Avoiding conflict with mitigation policies. Although not a "screening" criterion in the same sense as the previous three, this criterion should be considered in any decision to impose new or increased developer fees on candidate activities meeting the other three initial criteria.

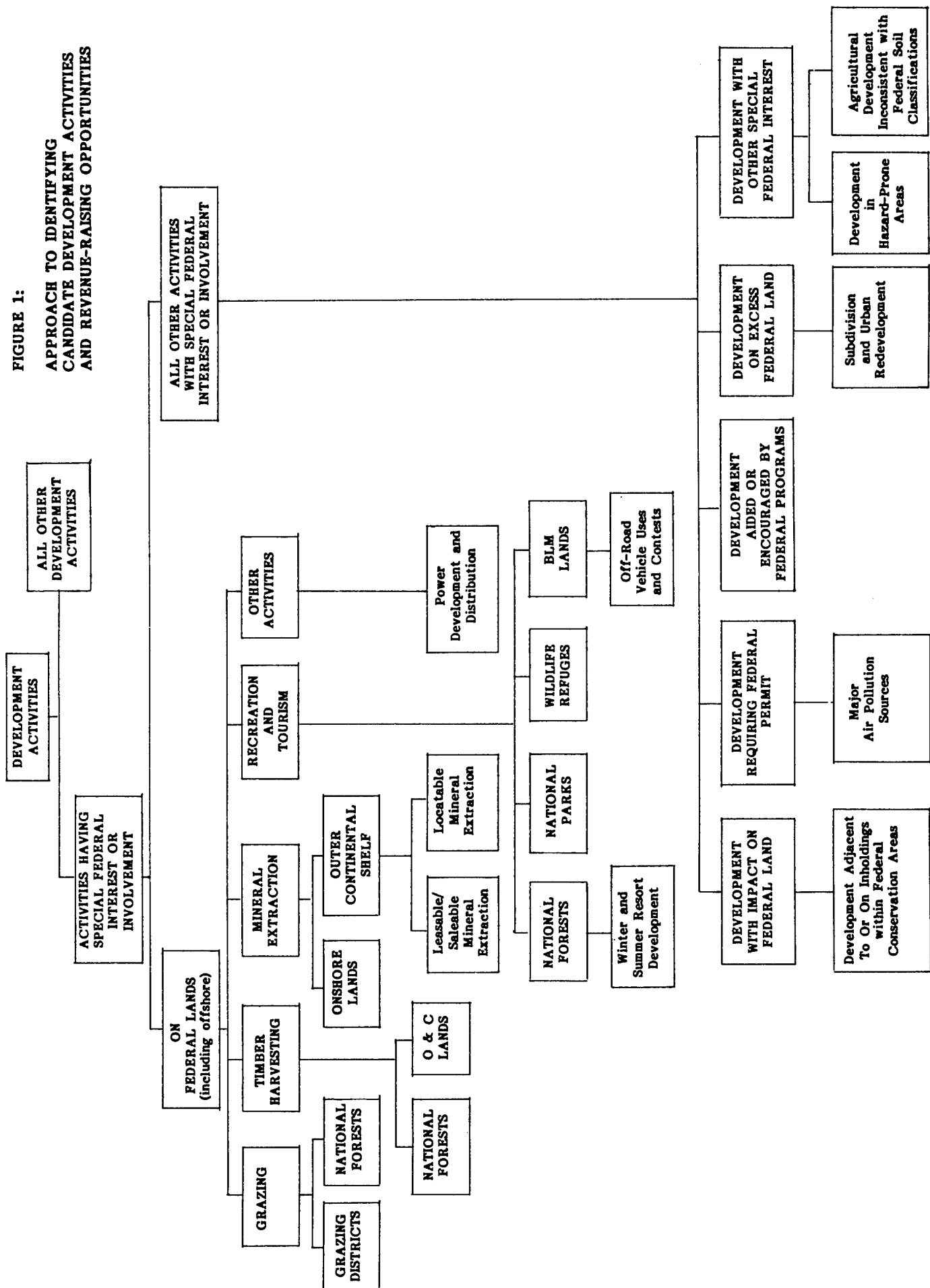
A number of development activities are subject to Federal "mitigation" policies, which may require replacement or compensation for environmental damage resulting from the activities (National Environmental Policy Act 1969).<sup>1</sup> How, if at all, should a tax or charge on these same activities affect requirements? Present Fish and Wildlife Service mitigation policies make clear that habitat replacement or compensation is not, for the highest resource category lands, an acceptable substitute for the avoidance of adverse impacts in the first place (43 FR 56005, Section 1508.20).<sup>2</sup> By extending these policies, this study establishes a criterion that any new or increased development charge or fee not be applied to justify adverse habitat impacts or justify the avoidance of mitigation otherwise required.

The approach utilized in this study for identifying candidate development activities potentially appropriate for the imposition of developer fees under the Fish and Wildlife Conservation Act is summarized in Figure 1.



FIGURE 1:

APPROACH TO IDENTIFYING  
CANDIDATE DEVELOPMENT ACTIVITIES  
AND REVENUE-RAISING OPPORTUNITIES



## DEVELOPMENT ACTIVITIES HAVING NO SPECIAL FEDERAL INTEREST OR INVOLVEMENT

As discussed above, only if a development activity is subject to some special Federal interest or involvement can it satisfy the initial criterion established for this study. Accordingly, no candidate development activities are identified from among the range of activities for having no special Federal interest or involvement.

State and local governments considering developer fees as a potential source of matching funds for fish and wildlife programs may nevertheless wish to evaluate some of these activities that have "no special Federal interest". Many communities already impose charges on developers to defray the cost of public services and infrastructure such as parks, schools, roads and sewers that are needed to serve new development. One of the key issues that arises in evaluating the legal and political feasibility of these charges is the linkage between the public facilities or services, on the one hand, and the development that is made to pay for them, on the other.<sup>3</sup> Many kinds of development can adversely affect habitat or benefit from wildlife programs and nearby refuges, thus, there may indeed be sufficient linkage to warrant exploration of developer fees (including such mechanisms as special assessments, extractions on development permission, impact taxes/fees, and transfer taxes) as a means of funding State and local fish and wildlife programs.

## DEVELOPMENT ACTIVITIES ON FEDERAL LANDS

Statistical information on lands of the United States and its possessions is published yearly by the Bureau of Land Management. The following brief summary of Federal lands is taken from Public Land Statistics 1983, Bureau of Land Management. In addition to Federal lands and inland waters within the 50 States, the Federal government also holds primary jurisdiction and management responsibility for the United States Outer Continental Shelf and resources. This area of Federal jurisdiction and management responsibility extends from the limit of State control (three miles offshore in most cases) to the limits of U.S. territorial waters, and beyond to the 200 mile limit of the Exclusive Economic Zone.

The gross area of the 50 States totals roughly 2.3 billion acres with approximately 2% of this total being inland water surface. Federal civilian and defense agencies administer 730 million acres, or 32%, of the gross area. Jurisdiction over about 342 million acres, or 47%, of the Federally-administered lands is held by the Bureau of Land Management. Approximately half of the Bureau of Land Management acreage is in Alaska.

In addition to the Bureau of Land Management, other major land-holding agencies in the Department of the Interior include the Fish and Wildlife Service (85 million acres), the National Park Service (77 million acres), and the Bureau of Reclamation. The Forest Service, within the Department of Agriculture, has jurisdiction over 192 million acres.

Table 1 summarizes Federally-owned land by predominant usage.

Table 1. Federally-owned land by predominant usage.<sup>a</sup>

Usage	Acreage	Principal agencies
Agriculture	3,110	Department of Agriculture
Grazing	161,774,789	Department of the Interior, Department of Agriculture
Forest and wildlife	433,319,005	Department of the Interior, Department of Agriculture
Parks and historic sites	100,595,031	Department of the Interior
Office building location	16,561	General Services Administration
Military (excluding airfields)	10,610,001	Defense Agencies
Airfields	721,391	Department of Transportation
Harbor and port facilities	45,631	Defense agencies
Power development and distribution	1,503,443	Department of the Interior
Reclamation and irrigation	3,680,457	Department of the Interior
Flood control and navigation	8,508,770	Corps of Engineers
Vacant	2,803	General Services Administration
Institutional	550,973	Department of Justice
Housing	1,435	--
Storage	284,067	--
Industrial	2,746,645	Department of Energy
Research and development	727,314	Department of Agriculture, NASA
Other land	4,729,427	Department of the Interior

<sup>a</sup>Source: detailed listing of real property owned by the United States and used by civil agencies throughout the world as of September 30, 1982, General Services Administration, Office of Administration, March, 1983.

## Potential Candidate Activities and Revenue Raising Opportunities

During the course of the "developer fees" study a number of development activities occurring on Federal lands (including natural resource and recreational facility development as well as urban-type development) were suggested as potential candidates for the imposition of new or increased charges or taxes. Because these suggested activities occur on Federal lands, all satisfy the "special Federal interest or involvement" criterion established for this study.

A few suggested activities also have some prospect of meeting the wildlife linkage criterion in terms of habitat affected or potential disruption to the natural environment. These are listed below as potential candidate activities. The potential candidates have been grouped for discussion in five broad categories: grazing; timber harvesting; mineral extraction; outdoor recreation; and "other". The relationship of these categories to the basic approach utilized in the study to identify candidate activities is shown in Figure 1.

Grazing: increase grazing fees on Bureau of Land Management and Forest Service lands. Grazing, the largest (in terms of acreage) use of Federal land, occurs on Bureau of Land Management and Forest Service lands and may be considered a category of natural resource development. Grazing fees have been a source of continuing controversy since they were first imposed in 1906. Conservation organizations have asserted that ranchers graze their livestock on Federal lands at fees often lower than the fees paid to rent private grazing land. Ranchers, on the other hand, have expressed concern with Federal reductions and restrictions on grazing use at the same time that other Federal land uses are showing an upward trend (Clawson 1983).

It has been suggested that increased grazing fees (levied on graziers, considered to be natural resource developers in this case) be evaluated as a potential funding source for the Fish and Wildlife Conservation Act. Arguments advanced to support this suggestion include:

- a. Current grazing fees, it has been asserted, do not reflect fair market value; and
- b. The potential exists for environmental damage and wildlife habitat impacts as a result of overgrazing and poor range management.

Grazing fees, however, have been the subject of much in-depth research and numerous investigations, with possibly a dozen major studies undertaken on this subject (Clawson 1983). Also, the Federal revenue-raising mechanisms attached to grazing are based on complex legislative and administrative arrangements.

Timber harvesting: increase stumpage prices on timber sales or impose new tax on commercial timber harvesters in National Forests and O and C lands. Most of the Federal timber lands -- roughly 92 million acres -- fall within the National Forests and are administered by the Forest Service. The National

Forests annually provide 21 to 23% of the total timber harvested in the U.S. (compared with about 30% from forest industry lands and 50% from other public lands).

In Western Oregon, an area of 2.1 million acres comprises the O and C lands under Bureau of Land Management authority. Originally public domain, this acreage was reconveyed and reverted to the Federal government from previous Federal grants made to private concerns to construct the Oregon and California Railroad and the Coos Bay Military Wagon Road. The value of timber sold from the O and C Lands is a relatively small component of the total volume of Federal timber sales (Clawson 1983).

Sales of uncut National Forest timber are held at certain times throughout the year and receipts from timber purchasers (considered to be the natural resource developer in this case) are the largest single source of revenue of any U.S. Department of Agriculture program, totaling \$947 million in 1981. Due to the effects of Federal timber policy on the overall economy, the terms of timber sales from National Forests are expected to continue to be a significant National policy issue in years ahead.<sup>4</sup>

It has been suggested that increased fees or new taxes imposed on timber harvesters be evaluated in this study. To support this suggestion the argument is made that timber harvesting and associated activities such as road building and timber processing may result in disruptive and damaging impacts on wildlife communities and habitat. As with grazing fees, however, the Federal revenue-raising mechanisms attached to timber harvesting are administratively complex.

Mineral extraction: reallocate a portion of the Federal revenues collected through leasable mineral extraction fees, taxes, bonuses, and royalties.

Mineral extraction: impose charges on future extraction of locatable minerals from the Outer Continental Shelf. Mineral extraction, which takes place on Federal "onshore" lands and on the Outer Continental Shelf, is administered primarily by the Minerals Management Service; a relatively small amount of mineral development takes place in National Forest lands administered by the Forest Service. This general category of natural resource development may be further classified according to leasable minerals and locatable minerals -- leasable minerals including coal, oil and gas; locatable minerals including fertilizer, industrial, and metallic minerals.

The Mineral Leasing Act of 1920 provides for the leasing of onshore coal, oil, and gas and for the granting of mining rights on Federal land while the Outer Continental Shelf Lands Act Amendments of 1978, administered by the Minerals Management Service, permits the Federal government to lease offshore lands for mineral exploration and extraction. Of all the uses of the Federal lands, oil and gas bring in the largest revenues and, since the 1960's, the Outer Continental Shelf has produced about two-thirds of the Bureau of Land Management's receipts, producing much greater revenues than the agency's onshore oil and gas, timber, and grazing receipts (Clawson 1983).

To date, almost all leasing and mineral extraction from Outer Continental Shelf holdings has been for oil and gas. Although still in the experimental

stage, some believe that there are commercially recoverable quantities of sand and gravel, as well as "crustal" deposits of manganese, cobalt, and other strategic minerals, on the Outer Continental Shelf. As with oil and gas, extraction of these minerals by private interests could yield revenues to the Federal government.

The rationale for suggesting that a relatively small portion of Federal revenues collected through existing leasable mineral extraction fees, taxes, royalties, bonuses, etc., be reallocated to State wildlife programs is based largely on the arguments that:

- a. There is potential for large scale environmental impacts affecting fish and wildlife habitat;<sup>5</sup>
- b. There are somewhat analogous programs whereby the Federal government allocates a portion of Outer Continental Shelf revenues to the Land and Water Conservation Fund; and
- c. These sources currently generate relatively large amounts of Federal revenues (particularly Outer Continental Shelf revenues).

Extensive research has been focused on leasable mineral extraction from the Outer Continental Shelf. For example, the potential environmental impacts (both onshore and offshore), of leasable mineral development as well as the optimum distribution of Federal revenues raised from mineral extraction fees, royalties, bonuses, etc., has been the subject of numerous studies. In addition, the extraction of leasable minerals is currently governed by complex legislation and administrative arrangements.

On the other hand, locatable minerals on the Outer Continental Shelf and in the deep seabed represent a currently untapped resource which, to date, has been the subject of relatively little research. No leasing framework currently exists which would govern the extraction of locatable minerals on the Outer Continental Shelf. If, however, the extraction of these minerals proves to be commercially viable, it may be subject to the same statutory and regulatory provisions that apply to oil and gas activities on Federal offshore lands. Although the extent and value of these offshore resources is currently unknown, future extraction of these minerals could represent a potential source of future Federal revenues as well as a potential source of habitat disruption. Hence, the suggestion to evaluate the potential for allocating a portion of future revenues so generated to Federal programs that support State wildlife management activities.

#### Recreation and Tourism

- a. increase user permit fees for off-road uses and contests, and for other recreational activities on nonwilderness Bureau of Land Management lands.
- b. Impose one-time development charge (to be added to leasing fees) for new development on non-wilderness Bureau of Land Management lands.

- c. Increase special use permit fees/leasing fees for winter sports sites, summer resorts, and associated development in National Forests.
- d. Impose one-time development charge (to be added to permit leasing fees) for winter sports sites, summer resorts, and associated development in National Forests.
- e. Impose new tax or charge on private outfitting/guiding businesses located in National Forests.

The four major Federal land agencies providing recreational opportunities are: the Fish and Wildlife Service (National Wildlife Refuges); the National Park Service (National Parks); the Forest Service (National Forests); and the Bureau of Land Management. A wide variety of outdoor recreation activities takes place on these lands, all of which depend on the use of valuable natural resources.

Recreational development differs from other uses of Federal land that may be categorized as natural resource development in that present charges for recreation are primarily for services provided the user (e.g., ski lifts) rather than for the natural resource itself. Although outdoor recreation involves the largest number of users of the Federal lands, recreation development returns less than 1% of the total revenue collected from all Federal land uses (Clawson 1983).

Of the four major categories of Federal recreation lands, the more capital intensive recreational development generally takes place on Forest Service lands and on the non-wilderness lands administered by the Bureau of Land Management. Recreational development in the National Forests includes campgrounds and picnic grounds, swimming sites, boating sites, winter sports sites, organization camps, resorts, recreation residences and interpretive sites (U.S. Department of Agriculture 1983). All of these activities and more, including large scale competitive off-road vehicle events, take place on the Bureau of Land Management lands.

Large scale, capital intensive facilities on Forest Service and Bureau of Land Management lands (e.g., downhill ski areas, winter and summer resorts) are typically developed by private companies subject to Federal permit fees and lease arrangements. In total, the Forest Service raises, on the average, between \$12 and \$15 million per year from these arrangements. These monies are deposited with the U.S. Treasury as part of the general fund.

Several arguments have been advanced for suggesting that increased permit fees and/or lease fees on private developers of recreational activities be evaluated as possible sources of funding for the Fish and Wildlife Conservation Act:

- a. There is the potential for disruption to the natural environment and wildlife communities associated with such large scale development as downhill ski areas and such intensive recreational uses as off-road vehicle contests;

- b. It is sometimes asserted that this development receives benefits economically from the quality of the natural environment in which it is located; and
- c. It is sometimes asserted that the current fee and leasing structure governing private recreational development on Federal lands does not adequately reflect competitive market standards.

#### Other Activities

- a. Impose new fee/tax on power generating facilities (conventional, hydro, geothermal, wind, solar) and power transmission facilities developed on Federal lands.
- b. Increase fee/taxes on sale or lease of utility and access easements on Federal lands.

The previous suggestions and discussions have all been directed toward natural resource development and recreational development on Federal lands. From among the remaining uses of the Federal lands (see Table 1) the power generating and transmission category includes some development activities with potentially significant impact linkages to the natural environment and wildlife habitat. According to the 1983 annual report issued by the Bureau of Land Management, there has been a dramatic increase in recent years in domestic energy facility construction in the West, the vast majority of it on public land managed by the Bureau of Land Management (Bureau of Land Management 1983).

Although these power development activities take place on a relatively smaller amount of Federal acreage than natural resource or recreational development, it is argued that the capital intensiveness of these activities may present significant revenue-raising opportunities. Also, the potential for non-conventional power development involving geothermal, wind and solar energy in the future will present different types of environmental and habitat impacts and represent a currently untapped but potentially significant source of Federal revenues through future power development charges or taxation.

#### DEVELOPMENT ACTIVITIES WITH OTHER FEDERAL INTEREST OR INVOLVEMENT

In addition to development activities occurring on Federally-owned land, there are several categories of development on non-Federal land for which there is a special Federal interest or involvement (see Fig. 1). Several development activities within these categories were suggested during the course of this study as potential candidates for the imposition of new or increased charges or taxes for funding the Fish and Wildlife Conservation Act. The suggestions judged to have some prospect of meeting the wildlife linkage criterion are listed below.



## Potential Candidate Activities

Development with impact on Federal land: impose new fee or tax on private development activities adjacent to (or on inholdings within) Federal conservation areas (e.g., parks, wildlife refuges). Private development near Federal lands not only has potential for adversely impacting the Federal lands, but in many instances, is stimulated, enhanced by, and receives direct economic benefits from the Federal land or the activities occurring on the Federal land. For example, winter sports sites such as downhill ski areas within the National Forests typically stimulate large scale resort-related development on private lands outside the Federal land.

Power plant development would be another example of an activity which may occur on non-Federal land but have the potential for adversely impacting nearby Federal land.

It has been suggested that since private, urban-type development (e.g., second homes, commercial activities) adjacent to Federal conservation areas may not only be enhanced by the quality of the protected natural environment but may also adversely affect that quality, a new charge or tax would logically be imposed to reflect the potential benefit/impact.

Development requiring Federal permits: impose new fee or tax on air pollution sources (e.g., power plants). Development activities requiring Federal permits represent another category of special Federal interest or involvement. For example, development within this category would include dredge or fill activities affecting wetlands and subject to the regulatory requirements of Section 404 of the Clean Water Act as well as power plant development subject to permitting requirements under the Clean Air Act. (Some of these activities may also have potential environmental impacts on nearby Federal lands and could, therefore, also be discussed under the previous category. For example, power plant emissions have a documented impact on wildlife habitat, including habitat far removed from the source of the emissions).

Air emissions from power plants, smelters and other stationary sources move freely across boundaries and impact habitat irrespective of land ownership. While Federal and State air pollution standards regulate emission levels and prescribe appropriate technology, airborne pollutants (such as  $\text{SO}_x$ ,  $\text{NO}_x$ , and heavy metals) continue to impact natural habitat, as for example, from acid rain. Above and beyond permits and licensing fees, a special surcharge has been suggested for consideration, to be levied on major stationary air pollution sources. Care would need to be taken to assure that this charge not be interpreted as a fee-in-lieu of mitigation actions or a fee entitling the payer to pollute.

Development aided or encouraged by Federal programs. There is a wide range of Federal programs providing incentives and financial support for private development activities ranging from natural resource development to urban-type development (e.g., Community Development Block Grants). In some instances, it may be possible to link the development activity aided by Federal funds to a destructive or negative impact on wildlife habitat. Some Federal

aid programs may also have unintended consequences. For example, until recently, the availability of Federal flood insurance for residential development on barrier islands could be viewed as encouraging development on a sensitive natural area with associated impacts on wildlife habitat.

Development on excess Federal land: impose fee tax (e.g., subdivision tax) on private development. The Federal government disposes of excess Federal properties for a wide range of new or redevelopment uses, including industrial, commercial, and residential uses developed by the private sector (U.S. General Services Administration 1984). The potential for urban-type development on previously open lands is seen by some to pose the potential for significant disruptive wildlife habitat impacts (Conservation Foundation 1982a,b).

Concerns about habitat impacts have been expressed, particularly with regard to the sale of extensive tracts of public land in the West owned by the principal Federal land management agencies. As a result, it has been suggested that developers of urban-type development on previously open Federal lands be subject to a fee or tax to reflect the impact of this activity on habitat values. As with the previous suggestion concerning air pollution sources, care would need to be taken that this charge or tax not be interpreted as a fee-in-lieu of existing mitigation requirements.

Development with other special Federal interest: impose conversion tax on agricultural land uses inconsistent with Federal soil classifications. Development activities with other special Federal interest include activities on unique resource lands, on environmentally sensitive lands, on privately-owned lands where the Federal government has a reserved resource interest, and development on lands subject to natural hazards and potentially requiring post-hazard Federal assistance.

Concern has been expressed that development on resource-sensitive lands poses a potential disruptive impact on wildlife habitat justifying the imposition of a new or increased developer fee (not to conflict with existing mitigation requirements as discussed previously).

Example of development activities on resource sensitive lands with potential habitat impacts include both agricultural and urban-type development. For example, residential development in coastal floodplain areas may not only pose a potential impact on habitat, but may also require Federal assistance in the aftermath of a flood event.

Another example might be agricultural development involving tillage of lands that have been classified by the Soil Conservation Service as highly erodible (i.e., classes IV<sub>e</sub>, VI<sub>e</sub>, VII, and VIII). Government pressures to prevent or reduce such practices are evidenced by the proposed "sodbuster" legislation. Under the most recent version of this legislation, which has been passed by both the House of Representatives and the Senate (HR 3457 and S 663), farmers cultivating highly erodible soils would be denied Federal price supports and crop insurance for all of their crops (even those located on less erodible soils). The importance attached by the Federal government to soil conservation is also demonstrated in the Agricultural Conservation Program administered by the Agricultural Stabilization and Conservation Service

(Department of Agriculture). Under this program, the Federal government provides up to 75% of funds spent by farmers on soil conservation measures (e.g., strip cropping, no till agriculture, terracing, etc.) (Grines pers. comm.).

During the course of this study, it was suggested that a conversion tax imposed on agricultural land uses inconsistent with Federal soil classifications be considered as a potential funding source for the Fish and Wildlife Conservation Act. Such a tax might also act to deter the cultivation of erodible soils and therefore this suggestion should be viewed in relationship to the "sodbuster" legislation, the Agricultural Conservation Program, and other Federal efforts to encourage sound agricultural practices.

## PART TWO: EVALUATION OF SELECTED DEVELOPMENT ACTIVITIES

From the larger list of suggested candidate activities and revenue-raising opportunities discussed in the previous two sections, three topics have been selected for more detailed evaluation and discussion as potential funding sources for the Fish and Wildlife Conservation Act of 1980.

### TOPIC ONE: CHARGES ON DEEP SEABED AND OUTER CONTINENTAL SHELF NONFUEL MINERAL EXTRACTION

Nonfuel extraction from deep seabed and Outer Continental Shelf deposits may represent an opportunity for deriving new Federal revenues from development by private entities of offshore public domain holdings, as well as from mineral extraction in international waters.

In comparison to the offshore extraction of oil and gas, the study of nonfuel mineral extraction, in terms of both potential environmental impacts and revenue raising potential, is in its infancy. It is possible that major environmental impacts would result from Outer Continental Shelf mineral mining.

### TOPIC TWO: CHARGES ON THE PRIVATE DEVELOPERS OF SKI AREAS ON FOREST SERVICE LAND

This topic addresses two interrelated development activities: (1) the private development of downhill ski areas on land leased from the Forest Service; and (2) the privately-operated concessions and businesses which are also developed on Forest Service land to support the ski area.

This topic was chosen from among the selected candidates in the recreational development category for several reasons, including its relative capital intensity when compared to other types of recreational development on Federal land as well as the prominent role played by private development interests. In addition, the potential impact linkage to wildlife habitat appears particularly significant given not only the primary development impact on National Forest land but also the secondary impacts created by the spin-off, urban-type development which often occurs on adjacent private land.

### TOPIC THREE: CHARGES ON THE NON-FEDERAL DEVELOPMENT OF POWER PLANTS AND TRANSMISSION FACILITIES ON BUREAU OF LAND MANAGEMENT AND FOREST SERVICE LANDS

This topic was chosen primarily because of: (1) apparent opportunities to increase existing fees or add new charges for non-Federal power plant development; and (2) the potential impact linkage to wildlife habitat associated with power development and transmission (e.g., emissions, site transformation effects, etc.).

### TOPIC ONE: CHARGES ON DEEP SEABED AND OUTER CONTINENTAL SHELF NONFUEL MINERAL EXTRACTION

#### Description of Activity

Nonfuel mineral extraction from both deep seabed and Outer Continental Shelf deposits may represent a significant opportunity for expanding Federal revenues. This section addresses potential sources for funding the Fish and Wildlife Conservation Act from charges attached to offshore nonfuel mineral extraction.<sup>6</sup>

1. Outer Continental Shelf nonfuel mineral extraction. The Outer Continental Shelf Lands Act Amendments (1978), administered by the Department of Interior's Minerals Management Service, authorizes the Federal government to lease Outer Continental Shelf lands for exploration and extraction of mineral deposits.

To date, all of the leasing and royalties derived from mineral extraction on Outer Continental Shelf holdings have been for hydrocarbons. Although still in the exploratory stage, there is the possibility that commercially recoverable quantities of other minerals may exist on the Outer Continental Shelf. These include manganese nodules, cobalt-rich manganese crusts, sedimentary phosphates, polymetallic sulfides and placer deposits of mineral rich sand and gravel containing titanium, zircon, gold, platinum, chromite, rare earth minerals, and tin. The extraction of these minerals by private interests could provide new sources of revenues to the Federal government supplementing revenues now being derived from Outer Continental Shelf oil and gas activities.

A portion of the Outer Continental Shelf revenue stream is now allocated to the Land and Water Conservation Fund and the National Historic Preservation Fund.<sup>7</sup> (Several bills are now in Congress that propose the sharing of Outer Continental Shelf oil and gas revenues between the Federal government and the coastal states).

2. Deep seabed nonfuel mineral extraction. The Deep Seabed Hard Mineral Resources Act (1980) was intended to accelerate U.S. involvement in an international effort to explore the potential for the recovery of nickel, copper, cobalt, and manganese resources from the deep seabed. The Act specified conditions for the issuance of licenses for exploration, and permits for commercial recovery. Section 402 of

the Act also imposed a tax on the removal of hard mineral resources from the deep seabed, while Section 403 established a revenue sharing trust fund intended for sharing with the international community, pending U.S. ratification of a deep seabed treaty. However, the law stipulated that Congress could determine the use of these monies if, within 10 years after passage of the Act (1990), an international deep seabed treaty is not in effect. Since the U.S. has declined to be a signatory to the current version of the treaty, the disposition of any funds derived from commercial extraction of hard minerals rests with Congress. In keeping with the allocation pattern of revenues, it would seem reasonable to use a portion of the revenues collected from deep seabed mining in support of Federal and State conservation and environmental programs.

To date, four U.S. pioneer consortia have sought exploratory licenses. Negotiations with the National Oceanic and Atmospheric Administration's Office of Ocean Minerals and Mining are now in the final stage of the first round (exploratory) licensing. Since the consortia have filed for relatively large areas, the problems of overlaps, together with other procedures, are being worked out, as are agreements with other countries relative to the settling of disputes which may arise between U.S. and foreign competing consortia. (The U.S. will have jurisdiction over U.S. licensed consortia in international waters.)

#### Funding Potential

1. Outer Continental Shelf nonfuel mineral extraction. No leasing framework or royalty structure is currently in place for Outer Continental Shelf nonfuel mineral extraction. It is possible that such framework could derive from the formula that is used for onshore locatable minerals on Federal lands, or it could follow the pattern that applies to Outer Continental Shelf oil and gas exploration and recovery. Nevertheless, since nonfuel minerals extraction is still in its experimental phase, it is premature to place a dollar value on the resources, or to project revenue yields. For purposes of analogy, however, it might be noted that royalty payments from Outer Continental Shelf oil and gas extraction average 16.7% of production value (market value at point of landing). The overall range of royalty charges varies from 12.5% for extraction from particularly hostile or difficult environments, to 33.3% that applies to extraction from the Outer Continental Shelf off Orange County and Los Angeles, California. The rental fee for Outer Continental Shelf holding where no extraction is occurring is \$3 per acre per year.<sup>9</sup>
2. Deep seabed nonfuel mineral extraction. Deep seabed mineral mining is just entering the exploratory phase. Assessments of resource value are purely conjectural since price fluctuates with world market conditions and commercial recovery is some years away. Nevertheless, the Deep Seabed Act does provide for a tax of 3.75% of the imputed value of the recovered resource. "Imputed value" is

defined as 20% of the fair market value of the commercially recoverable metals and minerals. While no firm estimate of revenue potential is available, the fact that each of the consortia has spent in the area of \$50 million suggests that the returns from commercial exploration could be substantial.

### Economic Efficiency

1. Outer Continental Shelf nonfuel mineral extraction. Although Outer Continental Shelf mineral potentials have not been systematically documented, the potential commercial value of mineral-rich placer deposits from the Outer Continental Shelf may be considerable. Given the size of the U.S. Continental Shelf (1/3 of the Nation's land mass) and the positive identification of a wide range of strategic and valuable minerals, the possibility exists for the development of a major offshore minerals mining industry on the Atlantic, Gulf, Pacific, and Alaskan shelves. However, since the magnitude of the individual mineral resource is not yet known (beyond crude estimates), nor has it been determined which of the hard minerals are commercially recoverable, the effect of any future tax or royalty payment cannot be determined at this time.<sup>10</sup> Effects could be similar to those reviewed in the principal study under the section "Potential Assessment of Charges Related to Extraction of Certain Locatable Minerals", which dealt with onshore locatable minerals. Table 11 of that section reviews possible effects of various taxation strategies on resource use patterns. Royalties, for example, could potentially result in a slower pace of mineral extraction, reduced values of deposits to mining corporations, and higher initial prices to consumers. A capital gains tax could conceivably have no effect on extraction pace or values of deposits to corporations.
2. Deep Seabed nonfuel mineral extraction. Deep seabed mining is in its early pre-exploratory phase and, hence, costs and benefits are largely conjectural as is the volume of the resources. However, given the fact that strategic minerals such as manganese and cobalt are now imported, there could be a positive impact on the country's balance of payments from what, in effect, could be regarded as a non-foreign source.

### Wildlife Linkage

1. Outer Continental Shelf nonfuel mineral extraction. In terms of "benefits received", offshore extractors would receive few, if any, direct benefits from State fish and wildlife programs. However, if charges attached to offshore, nonfuel mineral extraction were used to fund the Fish and Wildlife Conservation Act, offshore extractors would be in a somewhat analogous position to Outer Continental Shelf oil and gas producers who currently pay rents and royalties to the Federal government, a portion of which is used to fund Federal Land and Water Conservation Fund grants to the States.

In comparison to the "benefits received" linkage, a potentially strong "habitat affected" linkage might be drawn between offshore mineral extraction and fish and wildlife habitat. Nonfuel mineral extraction on the Outer Continental Shelf could impact natural habitat both at the extraction sites and at the sites of onshore and near-shore support facilities. Judging from the environmental impacts and controversies associated with oil and gas leasing, exploration, and development on the Outer Continental Shelf, it is likely that impacts from and controversies over nonfuel mineral extraction could also be quite notable.

2. Deep seabed nonfuel mineral extraction. Deep seabed mining consortia might receive some benefits from State fish and wildlife programs relative to the point formulation of plans for the onshore disposal of tailings from minerals refining at tidewater locations. As with Outer Continental Shelf mineral extraction, a potential "habitat affected" linkage would be drawn at the sites of extraction and support facilities.

#### Ability to Pay

1. Outer Continental Shelf nonfuel mineral extraction. Inasmuch as the exploration, extraction, and processing costs for nonfuel Outer Continental Shelf mineral resources are not known, the cost consequences of rental payments, fees or royalties to user groups cannot be determined at this time.

In general, taxes and charges act as a disincentive during the research and development phase of industrial development. If nonfuel mineral extraction did prove to be commercially viable, royalty charges and other levies could be imposed once the industry was established. Such charges, at any probable level, are unlikely to have a significant impact on the mining of strategic minerals because of the scarcity and high value of these imports.

2. Deep seabed nonfuel mineral extraction. As previously noted, it has been reported that the four U.S. consortia have spent on the average of \$50 million each on "gearing up", even prior to receiving exploration permits. Given the anticipated value of the resource, and its importance relative to National interests, the impact on user groups of a tax on strategic minerals is likely to be small.

#### TOPIC TWO: CHARGES ON THE PRIVATE DEVELOPMENT OF SKI AREAS ON FOREST SERVICE LAND

##### Description of Activity

As noted in Part One, a wide variety of recreational development activities takes place on lands administered by the U.S. Forest Service. This section examines the development of privately operated ski areas on Forest



Service land. Reference will also be made to related development (for which there may be a special Federal interest) on private lands adjacent or near to the ski areas.

Fifty percent, or 184 of the United States' downhill ski areas are located either partially or entirely on Federal lands (National Forests) administered by the Forest Service. Development of these areas, all privately constructed and operated, has required slope cutting, lift and lodge construction, building of roads and parking lots, as well as other construction activities. Operation of the ski area and associated concessions entails the sale of lift tickets, and the operation of ski schools, restaurants, ski shops, and other skier oriented facilities.

The development of ski areas on Forest Service lands is often accompanied by associated development (e.g., resort hotels, condominiums, retail businesses, health and service facilities) on adjacent, private land. This associated development can benefit from and impact the National Forests. Benefits include increased cash flow, improved infrastructure generated by rising property values and a larger tax base, as well as the difficult to quantify aesthetic and "quality of life" benefits which may be associated with the natural environment. On the other hand, local plant and wildlife populations can be impacted by increased traffic loads, water consumption needs, waste disposal, non-skiing recreation, and construction activities. It has been argued that these capital intensive development activities should compensate for the benefits received and the adverse impacts they may inflict on the Federal land. At present, however, the necessary legal framework to tax, or impose fees upon, private development adjacent to Forest Service land would fall principally within the purview of State and local government authorities. Therefore, although this development is closely related to ski area development in the National Forests, it will not be discussed further as a potential source of Federal funds to implement the Fish and Wildlife Conservation Act.

#### Funding Potential

To date the Forest Service assesses a 2.5 to 3.5%<sup>11</sup> special permit user fee on the gross revenue of ski area operations situated in the National Forests. This applies to sales from lift tickets, ski school lessons, restaurant operation, ski shop services, and other revenue-generating activities. Potential revenues at the present rate, assuming an expected growth rate of 4 to 5%<sup>12</sup> in the user/day ratio, will increase from \$9 million in the winter of 1983-84 to \$11.7 million in 1989-1990.<sup>13</sup> The generation of any additional revenues would depend on the adoption of new revenue-raising mechanisms. For example, a fixed fee according to the size of the ski area (e.g., from \$100,000 to \$500,000<sup>14</sup>) collected with the issuance of special user permits for new ski areas could generate \$750,000 yearly.<sup>15</sup> Additional revenue of about \$3.0 million per year could be raised by increasing the special user permit fee from 3.5 to 4.5%.<sup>16</sup> Therefore, by utilizing both increases in the existing special user permits (yearly rents as percentage of gross revenue) and a flat fee structure, an average of \$3.75 million<sup>17</sup> of

total additional revenue could be collected every year. The regulatory framework to establish new revenues from ski area development would be found in already existing legislation.

### Economic Efficiency

Since skiing is a capital intensive sport requiring relatively expensive equipment, travel costs, and often lodging, in addition to lift tickets, it is generally considered an activity of upper and middle income persons. In addition, the type of recreational activity supplied by downhill ski areas has few substitutes, and may therefore be considered fairly inelastic. If ski area owners/operators passed a new or increased charge or tax on to the consumer, prices of lift tickets, ski school operations, and the goods/services marketed by concessions could be affected. If, however, a charge or tax to be imposed were large and could not be passed on the skiing public, it could possibly have a limiting effect on the development of new ski areas and cause the closing of some existing areas, thus impacting communities in relatively poor states and affecting an industry already subject to such risks as the whims of weather.

### Wildlife Linkage

In terms of "benefits received" the ski area operator and the concessions associated with the ski area directly benefit from the attributes of the physical environment - the topography, views, and aesthetic quality of the surroundings. Successfully exploited, these attributes yield profits to the developer, the operator, and the concessionaire. The argument has been made that enhanced wildlife habitat resulting from increased Federal aid to State wildlife programs may contribute to general enhancement of the skiing experience and therefore provide an indirect benefit to ski area operators.

The development and operation of a ski area may also result in significant environmental impacts. Impacts arise from the cutting of slopes, the construction of roads and lodges, traffic, the erection of lifts and the various retail and service support facilities which accompany ski area development. The environmental impacts of these activities may include: aesthetic impacts to the landscape; reduced wildlife populations; erosion; air pollution (arising from heavy traffic); and damage to cultural resource sites. Although often neglected, there are other impacts which are difficult to quantify but are nonetheless real. For example, there is a displacement cost - the "ski area's" interference with other activities such as hiking and camping, which have to relocate and thus impact other back country areas. In addition, the constructed ski area presents a loss in "nonuser values", detracting from the existence of pristine areas and potentially infringing upon the environment of future generations. Furthermore, future risk possibilities, such as bankruptcy, may result in an abandoned mountainside environment significantly altered from its pre-development site.

### Ability to Pay

If applied reasonably, extra fees might easily be assimilated by the skiing public. As noted earlier, downhill skiing is generally considered to

be an upper and middle income recreational activity. For example, the average household incomes of families skiing at Vail, Copper Mountain, and Loveland Basin in Colorado were recently surveyed at \$64,200, \$37,800, and \$29,100, respectively (Walsh et al. 1983). As long as an added charge or tax remains within reasonable bounds (relative to the larger overall cost of the total skiing experience), these income groups could presumably accept the added cost, particularly if the revenues so raised are seen to be targeted for environmental management purposes.

### TOPIC THREE: CHARGES ON THE NON-FEDERAL DEVELOPMENT OF POWER PLANTS AND TRANSMISSION FACILITIES ON BUREAU OF LAND MANAGEMENT AND FOREST SERVICE LANDS

#### Description of Activity

This section examines the possibility of funding the Fish and Wildlife Conservation Act through charges levied on private power plant/transmission line development on Federal lands administered by the Bureau of Land Management and the Forest Service.<sup>18</sup> Two types of charges are discussed: (1) a surcharge on the annual rental fees paid by utility companies to the Federal government; and (2) a one-time fee, analogous to a building permit fee, paid at the time of development. Neither of these suggested alternatives would be intended to replace mitigation activities currently required by the Federal government nor to justify the avoidance of mitigation otherwise required.

Two considerations make the investigation of a surcharge on power plant/transmission line development particularly timely. First, both the Bureau of Land Management and the Forest Service are currently reviewing their present rental fee structures. Second, the proposed criteria for determining these fees are not based on the value of power plant development to the utility companies, in terms of revenues generated, or on the "costs" to society-at-large of widespread habitat transformations.

Rental fees currently collected by the Bureau of Land Management fall under the Rights-of-Way Program, authorized by the Federal Land Policy and Management Act of 1976.<sup>19</sup> Under this program, the Bureau of Land Management issues right-of-way permits for a variety of private and public uses. These include linear uses such as roads, trails, pipelines (e.g., for water, oil, gas, and synthetic fuels), powerlines, and canals and also nonlinear uses such as power generating plants, communications sites, and reservoirs. A similar program exists within the Forest Service.<sup>20</sup>

Under existing regulations, right-of-way permittees are charged annual rental fees, set by an authorized officer within each State (i.e., an Area Manager, District Manager, or State Director), based upon his assessment of the land's fair market rental value.<sup>21</sup> Fee structures vary from State to State but generally range from 4 to 6% of fair market value (Cavanaugh pers. comm.).

In studying the possibility of revising the existing fee structures for right-of-way permits, the Bureau of Land Management and the Forest Service

will focus upon alternative methods for assessing fair market value as a basis for determining Federal charges (Federal Register 1984,a,b; Cavanaugh pers. comm).<sup>22</sup>

Instead of being based on fair market values, rental fees could instead be based on the receipts from the development activities for which the rights-of-way are being granted. This concept is not uncommon to other Federal land leasing programs. As discussed under the previous topic, Federal land leases to private companies for recreational purposes are based on a percentage of the value of total gross receipts to the company.

Right-of-way fees could also reflect the consequences of development activities on natural habitat. These consequences refer not only to noise, microclimate alterations, water quality degradation, soil erosion and air pollution, which are presumably mitigated for under terms established at the time of issuance of a right-of-way permit, but also to the transformation of the aura or ambience of a natural habitat.

### Funding Potential

Existing record keeping practices make it difficult to readily estimate the total revenue-raising potential from an increase or surcharge on rental fees related to power plant and power transmission line development on lands administered by the Bureau of Land Management. The Bureau of Land Management currently does not segregate the various categories of land uses included in its Rights-of-Way Program. A rough approximation of funding potential can, however, be made from figures of all right-of-way permits. Under the present system, surcharges on rental fees would yield amounts too low to warrant collection efforts. The average rental payment for example, is only \$60 (Federal Register 1984b). A surcharge of 1 to 5% would thus yield \$0.60 to \$3. Similarly, a surcharge on all right-of-way fees received in 1983, which totaled \$1,942,466 (Federal Register 1984b), would yield \$19,424 to \$97,120 in additional revenues. If, however, rental fees were based upon more appropriate criteria than fair market value (i.e., percentage of gross receipts of private utilities, and environmental transformation consequences), surcharges would undoubtedly yield considerably higher revenues.

Funding potential from rights-of-way issued for the development of power plants and related facilities alone, can be gauged from the 1982 Bureau of Land Management annual report, which stated that "... a substantial portion of the Rights-of-Way Program in recent years has been devoted to processing siting and right-of-way proposals associated with the dramatic increase in domestic energy development and facility construction in the West, the vast majority of it on public lands managed by Bureau of Land Management..." (Bureau of Land Management 1983:50). During Fiscal Years 1982 and 1983, the Bureau of Land Management was involved in various stages of the right-of-way granting process for at least nine major power plants and five major transmission lines (Bureau of Land Management 1983, 1984).<sup>23</sup>

Rights-of-Way records kept at the Forest Service headquarters (referred to as special use permits under Forest Service regulations) do segregate the various categories of land uses within the National Forests. Annual rental

fees for special use permits related to electric power lines and plants totaled \$733,000 in Fiscal Year 1983 (Sheppard pers. comm.), thus a surcharge of 1 to 5% would have yielded additional revenues of \$7,330 to \$36,650.

A second type of new charge worthy of consideration would be a one-time fee, similar to a building permit, levied at the time of power plant development. The advantage of this type of fee over the surcharge suggested above is that its application would not be contingent upon future revisions to the Rights-of-Way permitting system. The value of this one-time fee could be determined through the percentage of gross revenue and environmental impact criteria suggested above for Rights-of-Way surcharges.

#### Economic Efficiency

The economic efficiency of a surcharge added to rights-of-way rental fees can be evaluated in terms of the effect of the surcharge on: (1) the demand by private utilities for rights-of-way permits; and (2) the demand by consumers for electric power. It is doubtful that the surcharge would have any effect on either demand, particularly under the present rental fee structure. The efficiency of a surcharge under a revised fee system cannot be determined now; the system itself has yet to be revised.

#### Wildlife Linkage

Although utilities would most likely receive little, if any, direct benefit from funds allocated to State wildlife programs, there is a potentially strong linkage between power development and wildlife habitat in terms of "habitat affected". As mentioned previously, the construction and operation of power plants can cause numerous impacts to wildlife habitat including: noise; microclimate alterations; water quality degradation; soil erosion; and air pollution.<sup>24</sup> Many of these impacts are currently mitigated through existing regulatory programs.

According to the Bureau of Land Management Regulations (43 CFR 2801.2), Rights-of-Way permittees must carry out certain mitigation activities when deemed necessary by the authorizing officer. These consist primarily of: revegetation and the curtailment of erosion of the surface of the land; or any other measures deemed necessary. Regulations also require permittees to control damage to scenic, aesthetic, cultural, and environmental values (similar regulations exist for the Forest Service). Such impact reduction or mitigation efforts, although of obvious value, cannot reverse or compensate for the unavoidable transformations of wildlife habitat that accompany power plant development.

#### Ability to Pay

Judging by the average rental fees and potential surcharges estimated under "Funding Potential", it appears that permittees would be able to pay the surcharge.

## NOTES

1. Regulations prepared pursuant to the National Environmental Policy Act (NEPA) include a five-part definition of "mitigation" (43 FR 56005, Section 1508.20):
  - a. Avoiding the impact altogether by not taking a certain action or parts of an action;
  - b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
  - c. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
  - d. Reducing or eliminating the impact over time by preservation and maintenance operations furthering the life of the action;
  - e. Compensation for the impact by replacing or providing substitute resources or environments.
2. The U.S. Fish and Wildlife Service is concerned with mitigation needs for fish and wildlife and their habitat. The Fish and Wildlife Service's policy statement on mitigation (46 FR 7466-7663, January 23, 1981) adopts the National Environmental Policy Act definition of mitigation and identifies four resource categories with mitigation goals of decreasing stringency:

Resource category and designation criteria	Mitigation planning goal
1. High value for evaluation species and unique	No loss of existing habitat value
2. High value for evaluation species and scarce or value becoming scarce	No net loss of in-kind habitat
3. High to medium value for evaluation species and abundant	No net loss of habitat value while loss of in-kind habitat value
4. Medium to low value for evaluation species	Minimize loss of habitat value

3. Professionals in the land use planning field including government officials are currently directing considerable attention to the development of new strategies for exacting developer's fees based on the linkage concept. One of the more recent applications of the linkage concept was initiated in San Francisco in 1981. In this example, city officials have made a connection between new large scale office development and the city's housing shortage. Commercial developers are required to contribute to the costs of providing new housing as a condition for receiving development permission. (See the unpublished paper "Growth Management Goes Downtown: San Francisco's Linkage Program", by Phyllis Myers.)

By extension and analogy to the San Francisco linkage program, it might be possible to draw rational linkages between development fees exacted for the purpose of contributing to State and local wildlife programs and development activities benefiting from the existence of habitat and/or impacting habitat.

The legality of municipal efforts to exact developers' fees and apply those fees for public purposes based on various applications of the linkage concept will presumably depend on the reasonableness of the linkage between the development activity and the exaction being imposed. (See the forthcoming book, "Inclusionary Zoning Moves Downtown" edited by Dwight Merrian, David Brower, and Philip Tegeler.)

4. According to Clawson (1983), "The Forest Service sales policy affects the volume of timber sold from National Forests, which, in turn, affects the price of that timber; this, then, affects the price of lumber and other forest products. These prices affect housing costs, and the latter are included in the Consumer Price Index, to which many wages and retirement payments are linked. While the direct effect of timber prices seems

small, it is magnified greatly by its secondary effects. Thus, Forest Service timber sales policy gets translated into general inflationary pressures; that is, of course, the primary reason that the OMB, GAO, and the President have been concerned with the level of National Forest timber sales. In the complex economy and society of the United States today, the management of timber on Federal lands cannot be examined in isolation from the total economy".

5. Coal development is an example of a mineral extraction activity that has imposed significant impacts on a wide range of wildlife habitat types. On Bureau of Land Management lands, attempts have been made through reclamation policy and laws, required restoration of raptor habitat, and wilderness plans to minimize such impact. Coal mining, however, especially surface or strip mining often totally destroys the habitat and causes additional problems of soil erosion and flooding, revegetation is sometimes impossible. Since mining requires large amounts of water, it also impacts the natural aquifers and watersheds in a mining area further impacting habitat.
6. Three divisions of off-shore waters are referred to in this section: State waters out to 3 miles (or 3-marine leagues in two States and Puerto Rico); territorial waters of the U.S. out to 12 miles; the Exclusive Economic Zone out to 200 miles. Outer Continental Shelf holdings total 1 billion acres; Exclusive Economic Zone, 3 billion acres.
7. Of the \$900 million annual authorization to the Land and Water Conservation Fund [16 U.S.C. 460 L-5(c)(1)], about 95% generally comes from Outer Continental Shelf revenues. The remaining 5% or \$50 million is derived from park entrance fees, sale of surplus real property by the General Services Administration, motor boat fuel tax, etc.
8. Federal revenues are also raised from the issuance of mineral extraction permits in State waters. For example, in Fiscal Year 1983 the Corps of Engineers collected \$500,000 to \$600,000 from the issuance of Federal permits for sand and gravel extraction in State waters. These funds are remitted to the Treasury and become part of the General Fund. Currently, the Corps of Engineers charges a flat fee of \$100 for commercial extractors and \$10 for noncommercial extractors. About 16,000 permits were issued in Fiscal Year 1983.
9. For Fiscal Year 1983 Federal revenues from Outer Continental Shelf oil and gas operations were as follows: bonus payments \$6.579 billion; royalty revenues \$2.947 billion; and rental payments \$150 million.
10. It should be pointed out that research efforts on Outer Continental Shelf minerals potential are being accelerated both by the U.S. Geological Survey and private industry.



11. The method of assessing special permit user fees is extensive and complicated, involving computations of assets, growth, employment statistics, etc. For the analysis presented here the 2.5 to 3.5% of gross revenue will suffice, since on the average all ski areas on Forest Service lands fall within these bounds (Andersen pers. comm.).
12. In 1977, the Forest Service forecast that the ski area industry would generate an annual 7% rate of growth. The study said this growth rate would continue until 2033. However, recent trends show that the Forest Service grossly overestimated growth potential, which might at best be between 4 and 5%.
13. Using the present figure for ski area gross revenues (\$300 million), which yielded a National special user permit fee of \$9 million for downhill ski areas on Forest Service land, and an anticipated annual growth rate somewhere between 4 and 5%. This would put gross revenues in the year 1990 at \$390.6 million and Forest Service special user permit fees in ski areas at \$11.7 million (Conniff pers. comm.; Wier pers. comm.).
14. Presently there are at most two to three new ski areas started annually and most of those are small. Environmental concerns, a limited amount of locations, and adverse economic trends have caused larger ski areas to invest in snowmaking equipment and enhanced facilities rather than expansion. Therefore, even the 4 to 5% growth quoted here must be viewed with caution, when making long term projections.
15. With ski area starts limited to two or three small operations annually, it might be advisable to include expansion and/or modification of already existing sites in the fixed fee structure. When calculating the fixed fee, a conservative estimate of a \$250,000 charge on an average of 2.5 new areas per year, for the next 6 years was used. The size and range of fees can be varied beyond the presented figures as is necessary.
16. Statistical analysis:
  - given: present revenue base of special user permits in the winter of 1983/84 was \$300 million
  - present revenues generated with a special user permit rate of 3% in the winter of 1983/84 was \$9 million
  - projected growth rate for the ski industry between 4 and 5% until 1990.

Year	Revenue base <sup>a</sup>	Revenues			
		at 3% <sup>a</sup>	at 3.5% <sup>a</sup>	at 4% <sup>a</sup>	at 4.5% <sup>a</sup>
1983/84	300.00	9.00			
1984/85	313.50	9.41	10.97	12.54	14.11
1985/86	327.61	9.83	11.47	13.10	14.74
1986/87	343.01	10.29	12.00	13.72	15.44
1987/88	358.45	10.75	12.55	14.34	16.13
1988/89	374.58	11.24	13.11	14.98	16.86
1989/90	391.43	11.74	13.70	15.66	17.62
Total <sup>b</sup>	2,108.58	63.26	73.80	84.34	94.90

<sup>a</sup>All figures in millions of dollars.

<sup>b</sup>The total does not include the figures from the winter of 1983/84.

17. The amount of the combined revenues can be tailored to need, by changing the qualifications for the fixed fee to accommodate expansion and modification, and by varying the percentage increase in special user permit fees, which is to be earmarked for State fish and game commissions.
18. Permits for rights-of-way to Federal lands are also granted by other Federal landholding agencies, e.g., the Fish and Wildlife Service and the National Park Service. Their regulations for rights-of-way leasing arrangements are similar to those of the Bureau of Land Management and the Forest Service. Although not considered in this report, any additional investigations into surcharges on rights-of-way leases should include these agencies.
19. 43 U.S.C. 1761-1701 et seq., the Federal Land Policy and Management Act is the primary authority for granting rights-of-way to most land-use categories except for: (1) oil, natural gas, and synthetic fuel activities (authorized by the Mineral Leasing Act); and (2) the Interstate and Defense Highways and the Federal aid primary and secondary systems (authorized under the provisions of Title 23 of the United States Code).

20. The Bureau of Land Management regulations pursuant to rights-of-way are contained in 43 CFR 2800-6; Forest Service regulations are contained in 36 CFR 251.
21. The fair market rental value of lands designated for the siting of power plants and power transmission lines is usually determined through the Land Value Rental approach whereby rent is estimated as a percentage of land value (reviewed in Federal Register, Vol. 49, No. 88, Friday, May 4, 1984).
22. According to Cavanaugh, the Bureau of Land Management determinations of fair market value are much lower than land values determined by private land owners for the purposes of granting of easements for the same development activities on their lands.
23. Additional rights-of-way grants in which the Bureau of Land Management was involved include: 12 major pipeline projects; four major oil shale processing proposals; two major tar sands processing proposals; three synfuels projects; and two wind generation developments (sources: Bureau of Land Management 1984 and 1985; Managing the Nation's Public Lands: Fiscal Years 1982 and 1983).
24. Emissions from the stack of the Four Corners Power Plant, for example, caused a five-fold decrease in the area's visibility between 1963 and 1980 (Martin 1980).

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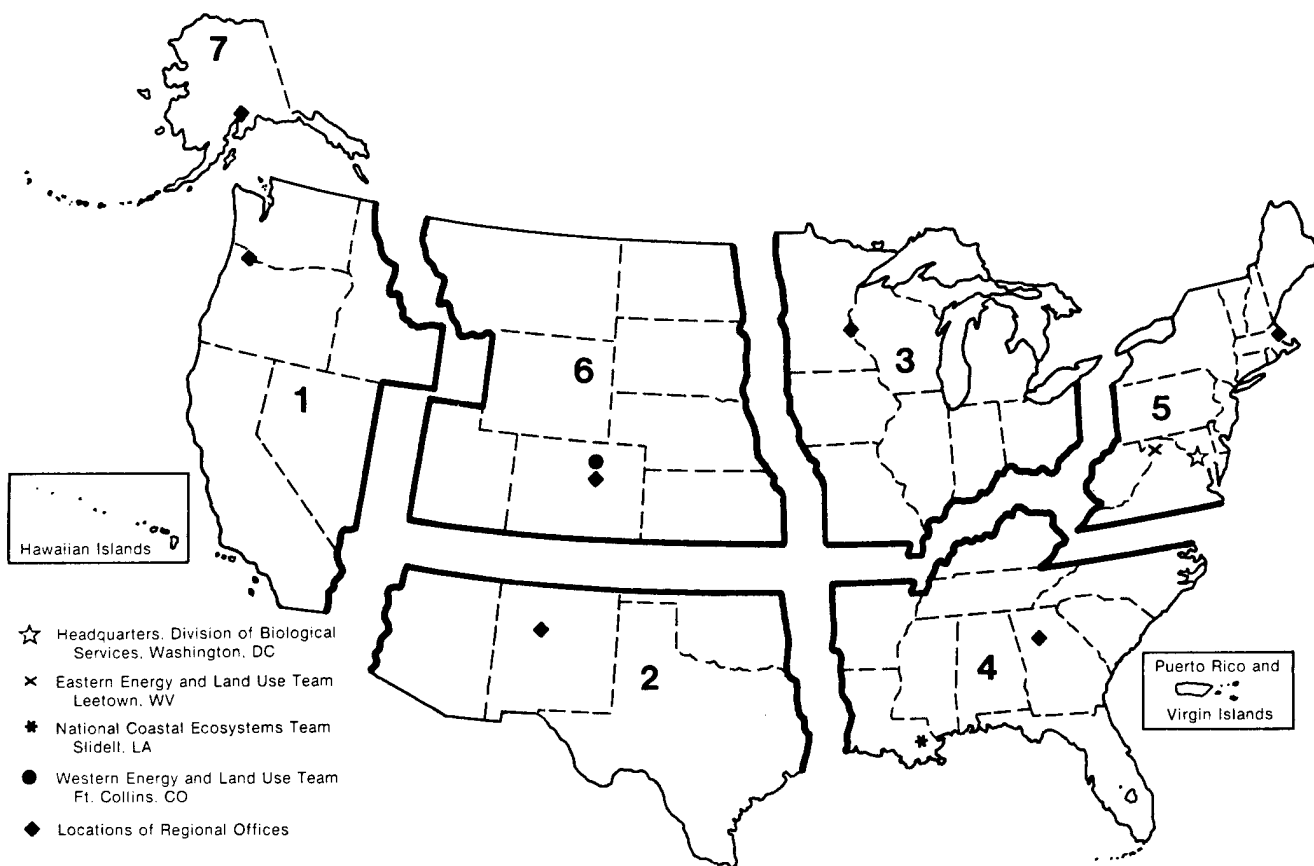
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<b>16. Abstract (Limit: 200 words)</b> <p>The purpose of this study was to develop information and data for determining, in consultation with potentially affected parties, the most equitable and effective mechanism for funding grants to States for nongame wildlife programs. Section 12 of the Fish and Wildlife Conservation Act of 1980, Public Law 96-366 (Forsythe-Chafee Act) authorized the U.S. Fish and Wildlife Service to conduct this comprehensive study. Congress specified that this study include, but not be limited to, funding by potential excise taxes on appropriate items.</p> <p>This is the first study to explore such a broad array of potential sources of funding for fish and wildlife, providing information that can be used to evaluate and compare the sources. It draws from the available studies and data, personal communications, academic writings, and other information pertinent to this subject. The volume of these existing materials, while extensive, was neither complete nor uniform in coverage. Thus, extrapolations and estimates were developed when necessary and possible.</p> <p>The body of the report presents the concise findings of the study regarding 18 potential funding sources and includes limited tabular material and process-related discussions.</p>			
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